Regional Spatial Development Framework for Mossel Bay Municipality

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Abstract

Undertaking a regional planning exercise to guide the development of a region in the global South has become an increasingly important task in light of the challenges that the regions in the developing world face in the twenty-first century. Regions in the global South need to suitably adapt to a plethora of challenges such as globalised economy, rapid growing population and impacts of climate change in order for the inhabitants of regions to prosper. This dissertation therefore aims to guide the development of the Mossel Bay Municipality in the Western Cape Province of South Africa to improve the spatial form, functioning and performance of the municipality that will benefit all people in the municipality by the year 2040. The regional spatial development of the municipality is based on a set of normative values and principles which include social justice, environmental sustainability and human development. It guides the development of the municipality through adopting a spatial targeting approach to the municipality's development whereby most future public and private investment is directed to the main town of Mossel Bay which is home to the majority of the municipalities' economic activity, population and infrastructural elements. The spatial targeting approach is selected based on the findings of a literature review of regional planning, the analysis of the environmental and humans settlement systems of the municipality and legislative context which the municipality operates under. The desired spatial form of Mossel Bay Municipality is then spatialised in three separate frameworks namely the environmental management framework, economic development framework and the settlement and services framework and collectively the three frameworks forms the regional spatial development framework of the Mossel Bay Municipality. The strategies formulated in each framework are firstly, formulated to achieve the vision of the municipality by the year 2040 and secondly in response to spatial opportunities and constraints that currently exists in the municipality. Through these strategies the regional spatial development framework aims to turn Mossel Bay Municipality into a socially equitable, environmentally sustainable and economically viable region.

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List of Acronyms

CBA: Critical Biodiversity Area

CFR: Cape Floristic Region

DEA: Department of Environmental Affairs

DEADP: Department of Environmental Affairs and Development Planning

DBE: Department of Basic Education

DHE: Department of Higher Education

DWAF: Department of Water Affairs

EDF: Economic Development Framework

EDM: Eden District Municipality

EPWP: Extended Public Works Programme

EMF: Environmental Management Framework

GDP: Gross Domestic Product

GDPR: Gross Domestic Product Region

GIS: Geographic Information Systems

HDI: Human Development Index

IDP: Integrated Development Plan

IPP: Independent Power Producer

LED: Local Economic Development

MBM: Mossel Bay Municipality

MW: Megawatt

NDH: National Department of Health

NGO: Non-Governmental Organisation

NMT: Non-Motorised Transport

NSDP: National Spatial Development Perspective

PDE: Provincial Department of Education

PDH: Provincial Department of Health

PGWC: Provincial Government Western Cape

PSDF: Provincial Spatial Development Framework

RSDF: Regional Spatial Development Framework

SANBI: South African National Biodiversity Institute

SDF: Spatial Development Framework

SNS: Settlement and Services Framework

WMA: Water Management Area

1. Introduction

1.1 Context of the Mossel Bay Municipality

The Mossel Bay Municipality is a non-metropolitan municipality located in the Eden District Municipality in the Western Cape Province of South Africa. It is located approximately 50km from George which is the capital of the Eden District Municipality and 390km from Cape Town which is the provincial capital and is connected to both capitals by the N1 national highway (Figure 1). According to the latest Official South African Census, the municipality had a population of 89 430 people in 2011 with this number having gradually increased over time (Stats SA, 2012b). Its history dates back to the 15th century when a Portuguese sailor named Bartholomew Diaz landed in the main town of Mossel Bay after missing the Cape due to a weather storm and was met by the local inhabitants of the area and became utilized as a port by the Portuguese settlers.

Mossel Bay Municipality therefore owes its origins and growth to the seafaring trade as the Portuguese expanded trade between Africa and Asia until the Dutch Settlers forced the Portuguese off the Indian spice route. Once the Dutch settlers moved into the territory, fishing and farming became a viable way of life, and trade revolved around the exporting of local products such as wheat. The granary was the starting point of growth in the town, and a contributing factor to the expansion of the Mossel Bay harbour. Fishing and farming remained the main economic activities of the area during the early years of the 20th Century, and the growth of the towns and villages in the municipality reflected this. This changed during the second half of the 20th Century with the discovery of natural gas fields offshore in 1969, in 1980 and in 1983, which led to the development of the Mossgas gas-to-liquids refinery.

The development of the refinery led to a rapid increase in the urban development of the Mossel Bay area, with the number of houses growing rapidly to accommodate the work force during the construction period. Mossel Bay Municipality today continues to be served by the offshore gas fields and agricultural activities which contributes to its growth however the municipality has expanded its economic function as the natural coastal beauty of the municipality has resulted in the municipality having a number of seaside holiday towns for tourists on the famous Garden Route of South Africa which is attractive for both local and international visitors. The continued pressure for development, fragile natural environmental and population growth has made it necessary for the municipality to undertake an appropriate spatial planning approach to ensure a prosperous long-term future for the residents of the municipality.

Figure 1: Context of the Mossel Bay Municipality (Stats SA, 2012).

1.2 Structure of the Regional Spatial Development Framework

The document is a report made up of 9 chapters. Chapter one is the introduction of the regional spatial development framework for Mossel Bay Municipality which includes the context of the municipality, the purpose and functions of a spatial development framework; the values which underpins the spatial development framework and the research methodology taken to complete the report. Chapter two is a literature review of regional planning which briefly describes the history of regional planning, reviews a recent and relevant regional planning approach advocated by theorists and planners and highlights the main arguments from the two contrasting approaches to regional development. Chapter three is the environmental analysis of the Mossel Bay Municipality. It identifies the trends, patterns and processes of the environmental systems of the municipality. These systems include the climate and water; land and biotic and material flow system. Chapter four is the human settlement analysis of the Mossel Bay Municipality. It identifies the trends, patterns and processes of the human settlement systems of the municipality. These systems include the population and social welfare; economic and infrastructure; and institutional arrangements.

Chapter five is the synthesis of the spatial opportunities and constraints of the Mossel Bay Municipality and includes the identification of the key development issues of the municipality which need to be solved to improve the functioning and performance of the municipality. Chapter six is the positioning of the regional spatial development framework for Mossel Bay Municipality through the selection of a suitable regional planning approach which is informed by regional planning theory and the legislative context in which the municipality operates. Chapter seven is the vision and programme of the Mossel Bay Municipality. The vision for the Mossel Bay Municipality describes the desired functioning and form of the municipality by the year 2040 and the programme includes a population projection and the implications of the population projection. Chapter eight is the regional spatial development framework for Mossel Bay Municipality. The regional spatial development framework is made of the three frameworks namely the environmental management framework, economic development framework and settlement and service framework. Chapter nine is the implementation of the regional spatial development framework and the key projects of the regional spatial development framework.

1.3 Purpose of the Regional Spatial Development Framework

The need for undertaking a regional planning exercise is directly related to the changes and growth that is taking place in regions as a result of an increasingly populated, urbanised and globalised world. According to the State of African Cities report these changes will take place in many cities and regions in African countries, with regions coming under tremendous pressure to deliver the quality of services for the future populations for the majority of African people (UN Habitat, 2010). Therefore it is essential that any regional planning exercise now makes strategic provision for the spending on basic infrastructure, social services (health and education) and affordable housing, in the process stimulating regional economies and generating much needed jobs. This requires regions to effectively respond to the challenges that are presented to them in order to have a prospering region. Effective region planning requires meticulous understanding of the forces which underlies the trends which are shaping the change and growth of a region (Scott and Storper, 2003).

In South Africa, effective planning takes place in the form of Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) which are guided by national development strategies and policies (DRDLR, 2010). Therefore this report is a Regional Spatial Development Framework (RSDF) for the Mossel Bay Municipality which serves as a policy document meant to guide public and private investment in the Mossel Bay Municipality from 2013 till the year 2040. The document makes strategic suggestions of what needs to happen in order to create a region that has quality public services, that is spatially integrated, economically viable and environmentally sustainable. These strategic suggestions are based on an analysis of the different sectors of the municipality whereby the main spatial opportunities and constraints are identified in the municipality. It does not set out to solve every problem that the municipality faces but attempts to thoroughly solve the key problems that municipality faces which will have the greatest impact on the long-term functioning and performance of the municipality. The document further provides a framework that will guide the various actors in the development of Mossel Bay and seeks to align development decision making. Fundamentally, the document provides strategic directives and protective principles to guide the development of the Mossel Bay Municipality until 2040 in light of the current and future challenges it faces.

1.4 Functions of a Regional Spatial Development Framework

Spatial Development Frameworks in South Africa vary for different municipalities as there are different types of municipalities namely metropolitan, non-metropolitan and district municipalities. However, according to the guidelines for the formulation of SDF's a credible SDF has the following characteristics firstly that it is based on an agreed vision and planning principles that promote equity and sustainability; for example: assisting with restructuring spatially inefficient settlements; promoting sustainable use of land resources channelling resources to areas of greatest need (social investment) and development potential (economic investment); and, stimulating economic opportunities in rural and urban areas (White Paper, 2001). Secondly that is it aligned with relevant national and provincial policy; thirdly it reflects a clear understanding of the reality of the municipal spatial environmental, social and economic systems, particularly with regard to urban infrastructure needs and capacity. Fourthly is realistic in terms of growth prospects and the financial and institutional capacity of the municipality to implement the proposals and fifthly provides guidance for sector plans and development initiatives from all government agencies, e.g. land reform programmes, and private sector projects that will contribute towards the municipality's vision (White Paper, 2001). The ultimate goal of the SDF is to achieve the desired spatial form of the municipality. This form is based on: the vision for the development of the municipality the principles set out in Chapter 1 of the Development Facilitation Act (DRDLR, 2011).

- Include a written and spatial representation of a spatial development plan for the spatial form of the municipality.
- Include a longer term spatial development vision statement for the municipal area which indicates a desired spatial growth and development pattern for the next 10 to 30 years.
- Identify current and future significant structuring and restructuring elements of the spatial form of the municipality.
- Include population growth estimates for the next five years to thirty years.
- Identify, quantify and provide location requirements of engineering infrastructure and services provision for existing and future development needs for the next five years.
- Include a strategic assessment of the environmental pressures and opportunities within the municipal area, including the spatial location of environmental sensitivities, high potential agricultural land and coastal access strips, where applicable.

1.5 Values and Principles

Planning is a normative exercise that is driven by values and principles (Roy, 2005). This RSDF is driven by the following set of values and principles to achieve the desired future for the Mossel Bay Municipality. All these values are all integrated with none more important than the other as illustrated in figure 2.

Social Justice

The value and principle of Social Justice needs to be strongly achieved in the Mossel Bay Municipality as historically people in the municipality have been exposed to uneven levels of social and economic opportunities. These opportunities were based on racial lines which have created a municipality with varying levels of service provision and socio-economic inequalities amongst the municipalities' residents. This RSDF creates a place where everyone, regardless of their economic means, gender, race, ethnicity or religion, is enabled and empowered to fully participate in the social, economic and political opportunities that municipality have to offer through the provision of quality infrastructure to realise a socially just and prospering region.

Environmental Sustainability

The value of Environmental Sustainability and the principles that emphasise sustainability need to be strictly applied to the growth and planning strategies of the Mossel Bay Municipality as the municipality is home to one of the most diverse natural environments on the planet. This requires the extensive protection, restoration and enhancement of the natural resources of the municipality. Through the robust application of environmental sustainability mechanisms in the municipality it will ensure that future generations of this municipality would able to live in a quality urban and rural environment. This RSDF will ensure that the municipality region adapts and effectively responds to challenges such as climate change as it confronts the Mossel Bay Municipality in the twenty-first century.

Human Development

The principle of Human Development needs to be strongly adhere to in the Mossel Bay Municipality as ultimately the success of the region will depend on how well the current and future residents will socio-economically grow in the municipality. Human Development, in terms of allowing people in the municipality able to socio-economically prosper through the provision of high levels of education and healthcare, good-paying jobs and quality basic services. Therefore this RSDF involves creating an

environment in which people can develop their full potential and lead productive, creative and prosperous lives in accordance with their needs and interests and where no one is excluded from this possibility. Ensuring Human Development is thus about expanding the choices people have to lead lives that they value.

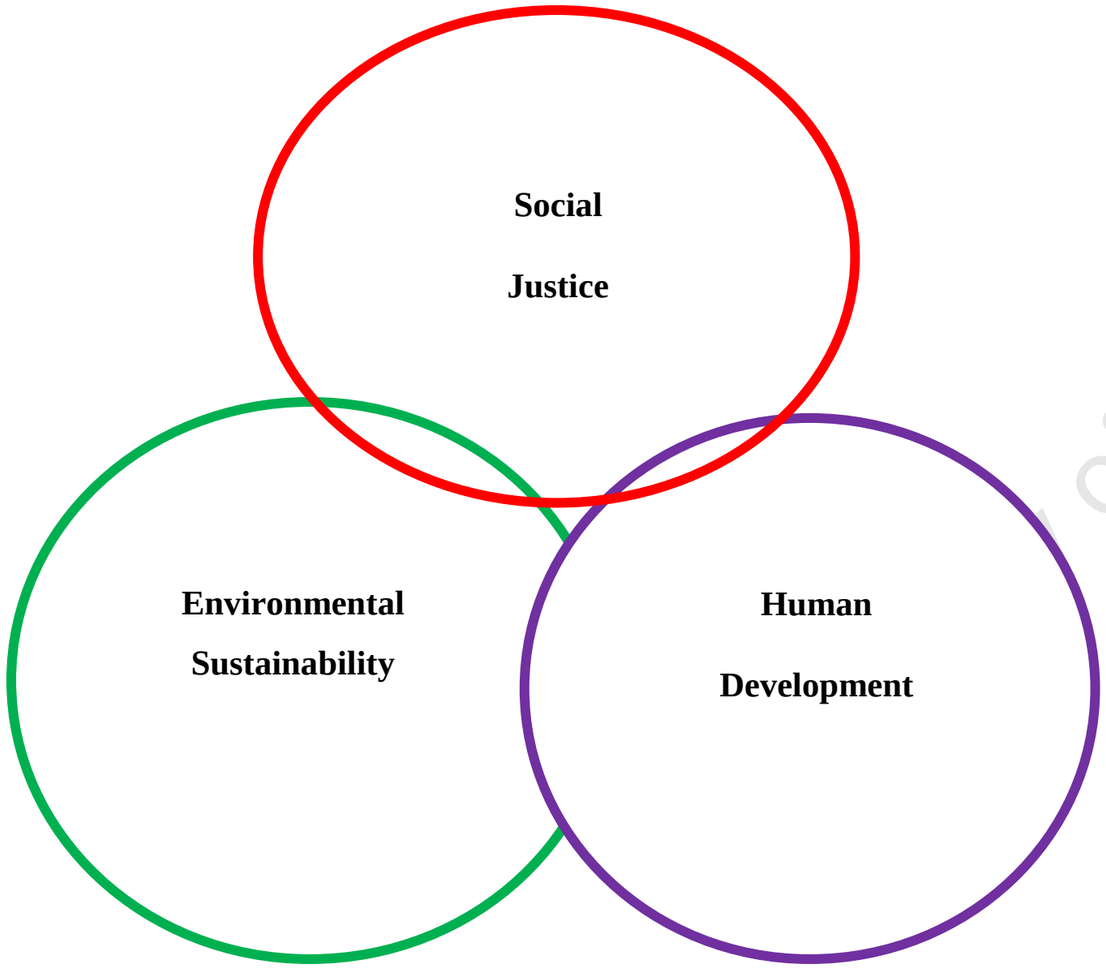

Figure 2: Values and Principles of the Regional Spatial Development Framework

1.6 Research Methodology

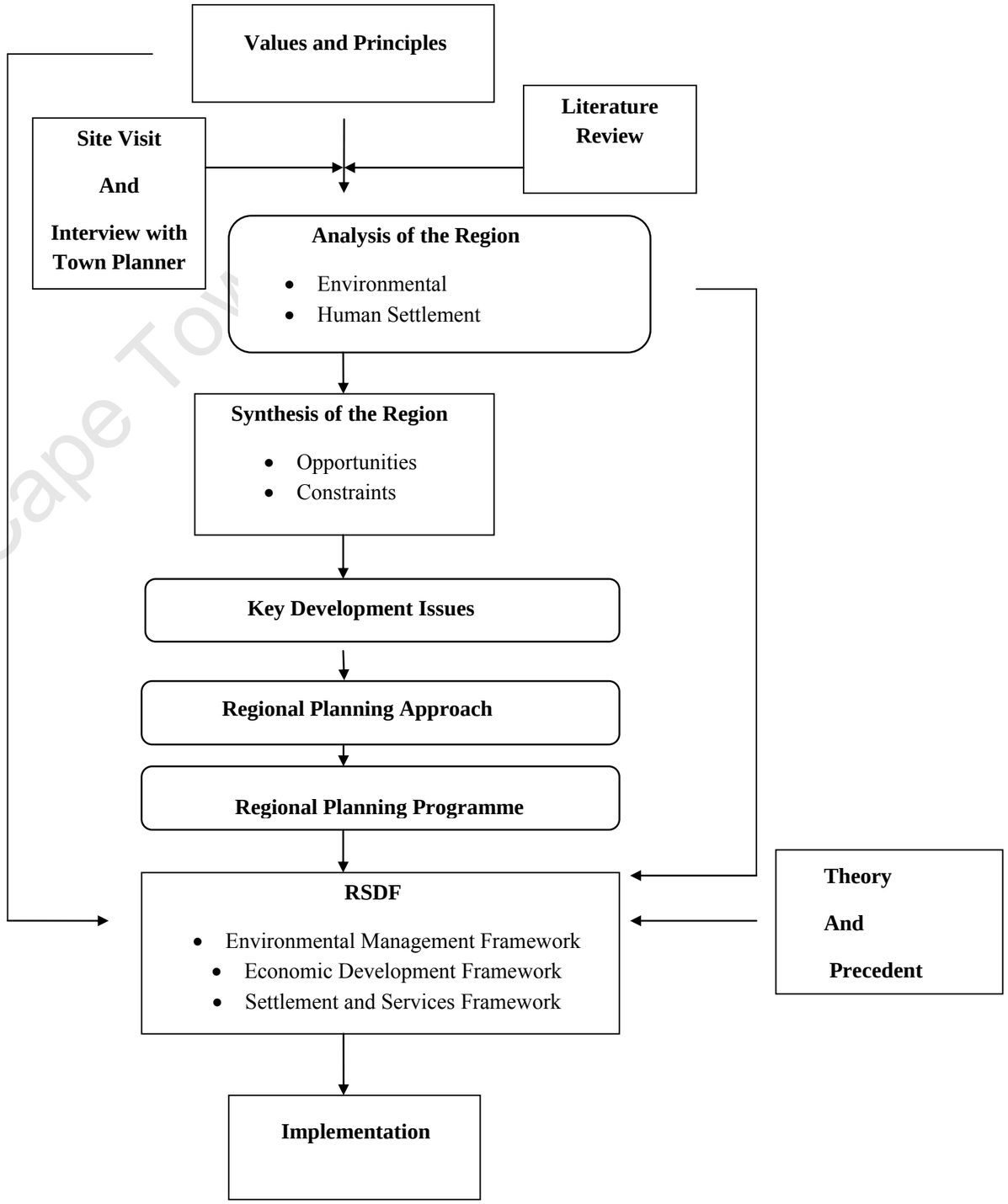

Figure 3: Methodology of the Regional Spatial Development Framework

The Research Methodology taken to complete the RSDF for Mossel Bay Municipality is illustrated in Figure 3. The research methodology describes the process taken to complete a project, dissertation or programme where each step details the actions involved gaining the desired outcomes of the activity (Berg, 2009). The overall research methodology taken to complete the RSDF is the case study research method. The case study method was selected as the entire study involved an in-depth study of the Mossel Bay Municipal area. The case study method allowed a detailed analysis of the functioning of the municipality to inform the strategies envisaged in the document (Flyvbjerg, 2011). The initial step taken to complete the RSDF was the establishment of values and principles which would inform the entire planning process. These values and principles would then be used in the process of developing planning strategies for Mossel Bay Municipality. The following action taken in the formulation of the RSDF was a site visit to the Mossel Bay Municipality which included an interview with the senior Town Planner of the Municipality. The site visit allowed for a greater understanding of the spatial functioning and performance of the municipality as it involved observing how the municipality functions in terms of movement and settlement patterns. The interview with the Town Planner was to gather information on the current functioning of the Municipality based on information known and seen 'at the ground' through the eyes of someone who deals with key development issues of the municipality on a daily basis. A set list of questions (see appendix) was posed to the Town Planner with his responses recorded to inform the planning strategies envisaged in this RSDF.

The formulation of the RSDF included a literature review of Regional Planning as a means to achieve the desired spatial form and functioning of a region. The purpose of a literature review is to highlight specific arguments and ideas in a field of study (Hart, 2001). The information gathered for the completion of the literature review was done through the sourcing and reading of peer-reviewed journals and books in the field of regional planning which were available online and in the university library. The key words used in the desktop study search for the literature review included regional planning, balanced regional developed and new regionalism. The literature review then informs the planning strategy taken in the RSDF. Once the literature review was completed, a thorough analysis of the different sectors of the municipality was conducted. The analysis utilised McHarg's 'layer cake' method in the building up of the municipality's environmental and human settlement systems (McHarg, 1969). This involved the task of sourcing the relevant information on the municipality using official municipal, district and provincial reports acquired through a desktop study and visits to the offices of the different organisations for hard-copy documents and geographic information systems data which were not available online. The analysis involves understanding the main trends, patterns and processes in the municipality and the implication of these trends, patterns and processes for the future of the municipality. The responses of the town planner from the interview together with the environmental and human settlement analysis of the municipality resulted in the synthesis of the region. The synthesis is essentially an evaluation of the environmental and human settlement systems of the municipality. The environmental and human settlement analysis allowed the identification of a number of spatial opportunities and constraints that exists in the municipality which has informed the way forward for the municipality. The identification of the key development issues in the municipality was also based on the findings found in the analysis chapters. These key development issues were seen as most pressing concerns of the municipality and solving them would significantly improve the functioning and performance of the municipality by the year 2040. The next step taken in the formulation of the RSDF was the positioning of the RSDF, where the regional planning approach taken is revealed and justified by previous examples of the regional planning approach adopted. The regional planning approach taken was further influenced by key national, provincial and district policy documents which were acquired through a desktop study as RSDFs need to be aligned with other key planning policy to be effective. The regional planning programme outlines the vision and population projection for the Mossel Bay Municipality.

The penultimate action in the methodology was the production of three separate spatial development frameworks using geographical information systems to spatially represent the desired spatial form for the municipality based on the findings of the analysis of the municipality. The three frameworks included an environmental management framework, a settlement and services framework and an economic development framework which were informed by theory and precedent. Collectively the three frameworks would make up the RSDF of the Mossel Bay Municipality. The final step in the formulation of the RSDF is the implementation plan of the RSDF and the key development projects which will improve the functioning and performance of the municipality. The implementation of any plan is the most critical aspect of the planning process as without proper implementation of strategies the objectives of the plan will not be met. The implementation of key development projects in the next five years sets the tone for the roll out of other development strategies that need to take place in order to achieve the vision set out for the municipality in 27 years' time.

2. Literature Review

This chapter is a literature review of regional planning which briefly explains the different eras of regional planning since its conception in the early twentieth century to the present day. Furthermore, it describes one of the most relevant and recent approaches advocated by regional planning theorists, the new regionalism approach. Finally it looks the advantages and disadvantages of taking a balanced or unbalanced approach to regional planning and development.

2.1 Brief History of Regional Planning

Regional Planning like many planning concepts is defined differently by different people in different eras (Pike, et al 2006). Some older definitions of regional planning include "it is the process of formulation and clarifying social objectives in the ordering of activities supra-urban space" (Friedmann, 1964:63) while a more modern definition of regional planning suggests it is a response to contemporary regional issues such as metropolitan growth, rural decline and regional imbalance (Glasson & Marshall, 2007: 20). From both definitions it could be understood that regional planning is an activity that moves beyond traditional town and city planning boundaries with the emphasis on solving spatial issues at a much larger scale. There have been 4 distinct eras of regional planning since the adoption of regional thinking by planning scholars and theorists with each era being influenced by specific development and economic development theory. The first era of regional planning took take place in the midst of the Great Economic Depression during 1930's where areas in the global North experienced huge inequalities between different regions (Dewar et al, 1986). Regional development through top-down planning policies thus sought to achieve regional balance through territorially defined regions which would occur through the investment of state resources in lagging regions of the southern parts of the USA in order to improve social and economic equity between people located in different parts of the USA. This form of territorially defined regions continued into the 1940's as regional planning for depressed areas, in particular became an important aspect of the Keynesian demand management technique which dominated national economic planning at the time (Dewar et al, 1986).

The second era of regional planning started in the 1950's and early 1960's as there was a new focus for regional planning. Moving away from territorially defined regions towards functionally defined regions but with the emphasis very much still on achieving regional balance (Dewar et al, 1986). Direct concern for economic development was combined with theories purporting to explain the location of economic activities. The explicit purpose of the new doctrine was to promote regional economic growth through induced urban industrialization (Glasson & Marshall, 2007). Regional planning became focused increasingly upon the following issues: the creation of an efficient space economy for economic growth, the modernization of depressed areas and planning the spatial distribution of population and economic activity. Industrial decentralisation and growth pole strategies were implemented to achieve regional balance in developed countries (Glasson & Marshall, 2007). The third era of regional planning during the 1970's marked the start of the movement away from trying to achieve regional balance as theorists and policy makers were no longer interested in pursuing top-down regional planning strategies as the results from previous regional development efforts had not yielded the desired results (Macleod, 2001). Thus, regional planning during the 1970's took a much more bottom-up approach with regards to regional development. With the focus of regional plans firmly on satisfying the basic needs of people in lagging regions where the provision of basic service strategies would lay the foundation for sustainable future economic growth in lagging regions.

The failure of the basic needs approach planning led to the regional planning suffering a marked decline in the 1980's. However, in the 1990's it once again came to the fore of planning and national policies. This period marked the fourth era of regional planning as planning theorists and policy makers realised that regions were competing globally with each other and thus there was need for regions to position themselves within the global context (Macleod, 2001). New regionalism is seen an emerging policy construct to balance the global logic of capital, seeking the most profitable locations, and the spatially-bound logic of regions seeking to tie capital down. The new socio-economic order requires greater activism on the part of cities and regions as each seek to position themselves in the competitive international economy (Rogerson, 2009). The proponents of new regionalism argue that globalisation has evacuated the nation-state capacity and dissolved the national scalar hierarchies of state power, leaving the region as the privileged territorial scale for the reassembly and organisation of governance capacity to promote territorial development (McGuirk, 2007). Therefore new regionalists consider regional planning as a deliberate and strategic forward-looking action whose impact permeates across economic, spatial, social and ecological levels of a given region (Healey, 2000; Healey, 2004; Rogerson, 2009). This leads to unbalanced development as there is a deliberate focus to invest in regions which have existing advantages in the global economy.

2.2 Relevant and Recent Approach to Regional Planning

Over the course of the history of regional planning and development a number of different ideas and approaches have been put forward as to how national and regional development should be promoted. The most recent approach to regional planning and development is the new regionalist approach which is argued by scholars that sub-national regions and supra-national regions have become increasingly important with specific regions becoming critical foundations of development processes (Makoni et al, 2008). New Regionalism is defined as a "body of thought which comprises firstly, the historic-empirical claim that 'the region' is becoming the 'crucible' of economic development and secondly the normative bias that 'the region' should be the prime focus of economic policy" (Webb and Collis, 2000:857). With the economic vitality of a country depending on a large extent on maximising the growth potential of its most important economic regions since the region is the most important economic space that can promote strategic spatial planning and economic development in a post-modernist era (Makoni et al, 2008). New regionalism sees a region as an area of sub-national extent which is governed by institutions that lie between central and local spheres of government. A region is also taken to mean a functional space governed by institutions below the nation-state scale. As a result, new regionalism regards city-regions as autonomous political agents of the global space economy (Jonas & Ward, 2007). Therefore, city-regions entail any major metropolitan area or a contiguous set of metropolitan areas together with surrounding hinterland in which politic and economic affairs are bound up in several intricate ways.

New regionalism is inherently a different kind of approach with regards to regional planning and development. The proponents of new regionalism argue that there are a specific number of conceptual foundations and preconditions that allow endogenous growth to take place in regions in a globalised economy. Firstly, new regionalism is mainly concerned with how regions can be made more competitive and get inserted into the global economy so as to attract global capital. Thus, it focuses on the building clusters and local economies of association. New regionalists believe regions need to attract more Foreign Direct Investments (FDI) in order to achieve economic growth and job creation (Rogerson, 2009). Thus, the theory of new regionalism considers cities and regions as important for the formation of nodes of dense economic, social and political activity. Regions are proclaimed as windows of locational opportunity for capturing, nurturing, and anchoring wealth creating activities (Harrison, 2010). This implies that regions should be competitive enough to be dynamic agents in the global economic order but should on the other hand, rely on regional development policy to regulate the adverse effects of globalisation and ensure sustainable regional development. To be competitive, new regionalism emphasises the formation of regional based industrial agglomerations and firm clusters as the crucibles of economic development (Brenner, 2002). Hence, new regionalists regard cities and regions as spaces for enhancing productivity capacities by encouraging firms to tap into the economic benefits that accrue from economies of scale associated with spatial agglomerations and clusters. New regionalists argues that the region-scale is small enough to allow for regular face-to-face interactions upon which trust and cooperation are built, and yet big enough to sustain a critical mass of inter-personal and inter-firm networks. In this way, new regionalists maintain that the sub-national scale provides competitive economic spaces indispensable for creating regional nodes of economic importance that attract global capital and increased investments (Sassen, 2001).

Secondly, institutions and institution-building form another key foundation of new regionalist thinking (Amin, 1999). Institutions in this case refer to "recurrent patterns of behaviours such as habits, conventions and routines" (Webb and Collis, 2000: 858). New regionalists argue that institutions provide unique untraded interdependencies which contribute 'soft' infrastructure issues such as social capital, reciprocity, trust, relationships and values which define a particular region and contribute to its uniqueness (Jonas and Ward, 2007). It is argued that social capital, social relationships and trust facilitate a balance between cooperation and competition that is essential for sustaining regional economic growth and development (Storper, 1995; Rogerson, 2009). These intangible aspects of production form regional based relational assets and portray the competitiveness of regions as a function of local things such as knowledge and alliances (Porter, 1998). Accordingly, the essence of new regionalism is that these institutional norms form the mesh of untraded interdependencies which exert positive impacts on firms and regions and their innovative capacities; and that regions characterised by institutional thickness tend to be well positioned for attracting investments (Amin & Thrift, 1995).

Thirdly, new regionalists also argue that institutions foster networks of cooperation, partnerships and encourage strategic urban planning (Deas & Ward, 2000). Institutional thickness, good governance and alliances are realistic at a regional scale, making the region potentially endowed with essential determinants of positive economic performance (Porter, 2003). Swanstrom (1996) argues that new regionalism thrives on voluntary associations and non-profit organisations that make successful intra-and inter-regional cooperation possible and allows for untraded interdependencies at a region-state scale. It is argued that economic systems at regional level are crafted and implemented through institutional arrangements that perform overarching governance functions and if well-arranged and nurtured, can

reinforce regional-wide competitive advantage. Regional level institutions can create greater regional coherence in policy making and implementation than when policy is orchestrated at nation-state level which is divorced from the daily interactions of local firms and business environment (Rogerson, 2009). New regionalist thinkers, hence, suggest that regional institutions are necessary ingredients for boosting bottom-up forms of regional policy to support endogenous regional growth and development.

Fourthly, new regionalism emphasises the notion of learning regions. Through learning and collaborative production processes, new regionalism projects regional planning as having the "capacity to integrate individuals and firms into a homogenous regional socio-economic structure" (Swanstrom, 1996:14). Accordingly, successful contemporary socio-economic spaces are characterised by institutional reflexivity that is built on a learning propensity which is derived from the application of both 'formal and informal' knowledge (Cooke & Morgan, 1998). As such, learning, innovation, science, technologies, research and development activities underlie regional economic growth (Lovering, 1999). Thus, new regionalism reinforces the significance of regional structures of learning and innovation, and that regions can become distinctive repositories of specialized technologies and expertise necessary for regional growth.

New regionalists view the specific conceptual foundations described above as the conditions required for regions to gain distinct advantages over other regions which they are competing against. Therefore regions which are able to meet most of these requirements are likely to experience endogenous economic growth and develop into prosperous regions. The conceptual thinking of new regionalism has been challenged on a number of grounds. Firstly, the way in which its prescriptive findings tend to be extrapolated from evidence taken from a limited number of prosperous regions in the developed world (Wheeler, 2002). Even in the noted success stories, the object of explanation of institutional thickness tends to be confused with the explanation itself, thus providing little support for the claim that prosperity depends either entirely or even in part upon the existence of embebbed networks of association (Wheeler, 2002). Secondly, the assumption that increased regional competiveness holds the key to economic regeneration, employment growth and long-term sustainable development is questioned as is the concept of regional competiveness itself (Lovering, 1999). This is because the concept is easily conscripted to justify an institutional bias towards larger firms, international business and high technology irrespective of their objective in the economic opportunities of the population in whose name those institutions supposedly exist. It is also questioned on the grounds that it reduces the region to the sum of its firms and in so doing accords undue primacy to the high-tech knowledge-intensive manufacturing sector whilst ignoring the role played by services, public spending and finance capital in raising per capita output (Wheeler, 2002). Yet these sectors and other non-manufacturing-related activities may be far more important in shaping the past development and future prospects of many regions. Thirdly, new regionalists imply that new technologies and related science and technology or research and development activities in the form of learning regions ought to be the most important sources of employment growth (Lovering, 1999). However, the reality is that these sources of employment have been static or declining in most advanced industrial countries. In the UK for example, employment in research and development outside the university sector has fallen a quarter since the 1980's while employment within the more tightly defined category 'researchers' has been falling by 10% per annum. Therefore it is a gross exaggeration to claim that-innovation-related sectors are a major source of new jobs, directly or indirectly, in regions or cities (Lovering, 1999). The arguments for and against new regionalism highlight the complexity of a regional planning and development exercise as there is no clear cut approach that guarantees endogenous growth which is required for the long–term well-being of a region.

2.3 Balanced or Unbalanced Regional Development

Throughout the history of regional planning and through the different ideas and approaches advocated to ensure regional development the principal question has always been between balanced or unbalanced regional development. The regional problem has always been about solving two spatial issues. Firstly, spatially uneven concentrations of people and economic activity (distribution of urban centres of different sizes) and secondly spatially uneven (or unbalanced) distribution of welfare between regions. The balanced development approach was favoured in regional planning policy and practise between 1930's and the 1970's where the emphasis was all about creating a much more spatially equal country. Regions with lagging areas would receive greater amounts of investment from top-down policies which would improve the employment and income levels of people in lagging areas whilst these policies will simultaneously improving the economic efficiency of a country through balanced development. In response to the lack of long-term success of these regional policies, theorists and planners advocated for a radically different approach (Weaver, 1984). Unbalanced development is thus seen as a better approach to ensure long-term growth in countries which were increasingly subject to a globalised world. The unbalanced approach has been seen in regional policies since the 1980's up until today. This is due to the developing and developed world becoming closer together in terms of free market trade as the

influence of neo-liberal economic policies dominated the globe. Therefore there is a need for regions in countries to take advantage of any spatial competiveness that they might have developed over time such as the agglomeration of industries such as Silicon Valley in the United States of America.

Balanced regional development through its various guises such as comprehensive river development, growth pole strategies and agropolitan development have been implemented over time to solve the regional inequality problem. One of the main advantages of facilitating balanced development is that it genuinely seeks to solve the social issues of inequality and poverty through utilising a top-down approach where the state plays a leading role in ensuring that this 'regional balance' is achieved; which in its embryonic form is essentially what regional planning was meant to do. It is argued if regional balance is not strived for then social and economic problems in both growing and lagging regions will increase firstly because metropolitan regions will not be able to cope with an increasing population and this spilling over must be accommodated elsewhere while secondly the quality of the livelihoods of people in lagging regions will continue to decline as a result of minimal economic stimulation (Hudson, 2007).

It is further argued that balanced development will attempt to solve the social and economic problems in lagging regions as these regions are commonly characterised by relatively high unemployment, low per capita incomes, below-average levels of human capital development, marked social deprivation, an inadequate level of public-service and infrastructure provision, etc. (Pike et al, 2007). Therefore, if implemented correctly, balanced regional development will lead to an increase in the amount of employment opportunities in the regions that urgently require economic growth. It is believed that this increase in economic growth will then lead to an increase in the economic income of people who reside in lagging regions which will translate into an improved living standard as people will be able to afford basic services which are essential to leading a quality life. The second advantage of balance development is that it attempts to improve the efficiency of the national economic functioning. As it allows a country not to be dependent on one single region for growth since one at any time that single region can become subject to substantial negative externalities which will in the long-term affect every region in a country (Pike et al, 2007). Thus without balancing the economic spatial structure of a country, its spatial structure would become transformed in an unsatisfactory manner or at an inadequate rate, so that the efficiency of the regional economy would be impaired, with the consequent loss of interregional or international competitiveness.

The main critique of balanced regional development is that balanced regional development has not effectively solved the long-term problems that lagging regions have faced. Since it is argued once national investments in lagging regions are downscaled, it leads to lagging regions becoming home to lame-duck industries as there is no increase in the economic productivity once state interventions are ended nor is there sustainable economic growth taking place as trickle-down effect advocated by proponents of balanced development does not become realised (Ascani et al, 2012). Therefore it is never–ending cycle which results in the investment of large amounts of money with little long-term benefit for the state or the region itself. The second critique of balanced development is that it leads to the building of wealth of firms and not to the building of wealth of people whom reside in regions (Amin, 2001). This is because firms who choose to relocate to lagging regions are given significant financial incentives by the state to do so thus are likely to generate vast amounts of profits within in a short space of time. This is what leads to the building of wealth of firms as they reap the benefit of state investment much more than the people who are employed in the firms (Ascani et al, 2012). Furthermore, firms in lagging regions are in much more appropriate position to relocate and invest elsewhere once state inventions are downscaled while the people in the regions are left behind to struggle as it is not that easy for people to simply relocate to another region once state interventions are downscaled due to social and financial reasons.

Unbalanced regional development predominantly through new regionalist policies is proposed due to the advantages unbalanced development has on the economic functioning and performance of a country and ultimately the increased levels in the standard of living for the majority of a countries population. Some of the these advantages include that dense regional agglomerations of economic activity are major sources of growth at virtually every stage of development today, as suggested by the worldwide expansion and spread of industrial clusters (Scott and Storper , 2003). This means specific regions have specific advantages for economic development and growth and these advantages need to be capitalised upon to ensure long-term growth and development. For example 40% of US employment is currently located in counties constituting just 1.5% of its land area. Equally, the geographical density of employment in many sectors has been on the increase. It has been suggested as well that 380 separate clusters of firms in the US employ 57% of the total workforce and generates 61% of the nation's output and fully 78% of its exports. While other researchers using conservative measures still find that 30% of the US workforce is accounted for by globally-orientated local employment clusters (Scott and Storper, 2007).

In many advanced countries, evidence shows that major metropolitan areas are growing faster than other areas of the national territory, even in those countries where, for a time in the 1970's there appeared to be a turn toward a dominant pattern of non-metropolitan growth. In less developed countries such as Brazil, China and India the effects of agglomeration on productivity are strongly apparent and economic growth typically proceeds at an especially rapid rate in the larger metropolitan regions of those countries. With specific regions having greater human and financial capital over other regions it is inevitable that regions with greater resources will have greater levels of economic growth and investment and they are better placed to ensure that economic growth and development takes place. The same metropolitan regions are at once the most important foci of national growth and places where export-oriented industrialisation is most apt to occur (Scott and Storper, 2003). City-regions always appear as privileged sites for economic growth because they economize on capital intensive infrastructure which is particularly scarce in developing countries thus permitting significant economies of scale to be reaped at selected locations (Scott and Storper, 2007).

The major critique of unbalanced development is that economic and social regional inequality increases with unbalanced development as evidence in the United Kingdom (UK) illustrates that levels of income and standard of life is significantly higher in Inner Core Region comprising of London compared with North and Wales region of the UK. This was due to significant higher levels of investment taking place in the Inner Core Region than in the North and Wales region between 1975 and 2000 in the UK (Mackay, 2003). This is reflected in the difference between earnings, employment levels and access to employment opportunities between the different regions therefore unbalanced development does not solve the social inequality problem which exists between regions. Therefore unbalanced development certainly contributes to regional inequality but London has become the richest area in Europe with its growing importance of trade with Europe and the value added per head in London is 47% above the rest of the UK which certainly shows that unbalanced development has its economic benefits (Mackay, 2003). This trend of increasing spatial inequality is seen in the developing world as well. It is widely acknowledged that the participation of China in world trade and international capital flows has strongly contributed to rising internal disparities in welfare levels between mainly agricultural inland areas and strongly urbanised coastal provinces (Fleisher and Chen, 1997; Zhang and Zhang, 2003). Divergence in regional income is suggested also in the case of India, with richer states registering rapid growth rates and driving national economic performance (Milanovic, 2005). Increasing regional disparities connected with agglomerated growth enhancing activities are further confirmed in the case of Indonesia and China (Akita and Kawamura, 2002). Whether deciding to undertake a balanced or unbalanced approach to regional development, both the advantages and disadvantages from each approach needs to be thoroughly considered. Ultimately the approach taken will depend on the specific context of the region. Not all regions in a country are capable of becoming major economic centres as a number of different factors make certain regional centres suitable for economic growth such as quality built infrastructure, high levels of human and financial capital and robust institutional governance. Hence, the regional planning approach taken needs to be based on a thorough analysis of the region, against the background of the opportunities and constraints that exist in the region and the performance of the region in relation to other regions in the country.

3. Environmental Analysis

This chapter is an analysis of the natural systems of the Mossel Bay Municipality. This chapter deals with the various elements of the natural system including climate, water and land, biotic and material flow systems. It then concludes with a synthesis of the environmental opportunities and constraints that exists in the municipality based on the findings from the analysis.

3.1 Climate Systems

The climate of any place on earth is directly influenced by its position relative to major climate belts and it is strongly controlled by altitude, topography and closeness to the ocean (Stone et al, 1999). Physically, the Mossel Bay Municipality is located between 21 and 22 degrees East on the line of Longitude to the East of the Atlantic Ocean. As well as between 33 and 34 degrees South on the line of Latitude South-West of the Indian Ocean. The main physical feature that influences the climate and weather of the municipality is the Indian Ocean coastline as figure 4 illustrates (Lubke & De Moor, 1999).

Figure 4: Geographical Position of Mossel Bay Municipality (Natural Earth GIS Data, 2013)

3.1.1 Temperature

According to data collected at the Cape St Blaize Weather Station, the main weather station located in the municipality. The mean monthly daily maximum temperatures of the municipality range between 24 and 18 degrees Celsius throughout the year. Monthly mean daily maximum temperatures during the summer and spring months are generally a several degrees higher than the mean monthly daily temperatures during the autumn and winter months (Figure 5). The mean monthly daily minimum temperatures of the municipality range between 18 and 12 degrees Celsius throughout the year. Monthly mean daily minimum temperatures are lowest in the winter and autumn months of the year while conversely the mean daily minimum temperatures are higher during the summer and spring months (Figure 6). This indicates that Mossel Bay has a moderate climate as the temperatures year-round in the region is not excessively cold nor exceedingly hot as in other parts around the world. These daily average temperatures allow favourable conditions for human habituation and the associated activities of human habituation (Gasson, 1998).

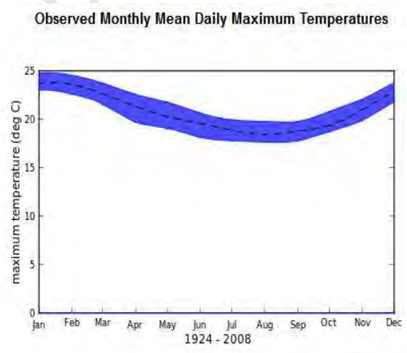

Figure 5: Monthly Mean Daily Maximum Temperatures (Climate Information Portal, 2013)

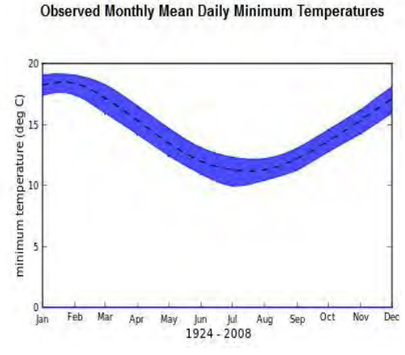

Figure 6: Monthly Mean Daily Minimum Temperatures (Climate Information Portal, 2013)

3.1.2 Precipitation

The Mossel Bay Municipality receives rainfall throughout the entire year however there are varying degrees of rainfall measured per month (Figure 7). The months where the highest amounts of rainfall were recorded are April, May and October which is during the autumn and spring periods. While the lowest rainfall recorded was during the summer and winter months of the year. According to the data collected at the Cape St Blaize Weather Station, the region receives approximately between 250 and 300mm of rainfall per annum which is much less than the average amount of annual rainfall of South Africa and significantly lower than the average amount of annual rainfall Worldwide which is 450mm and 850mm respectively. This indicates that the municipality can be considered a water scarce area highlighting the importance of water preservation and management in the municipality due to the low amounts of recorded rainfall which is the key source of water supplies (DWAF, 2004). The other main forms of precipitation that occurs is fog in the southern coastal areas during cold mornings and evenings and snow in the northern mountainous areas of the municipality during the colder winter months due to the dew point temperature dropping lower than actual temperatures.

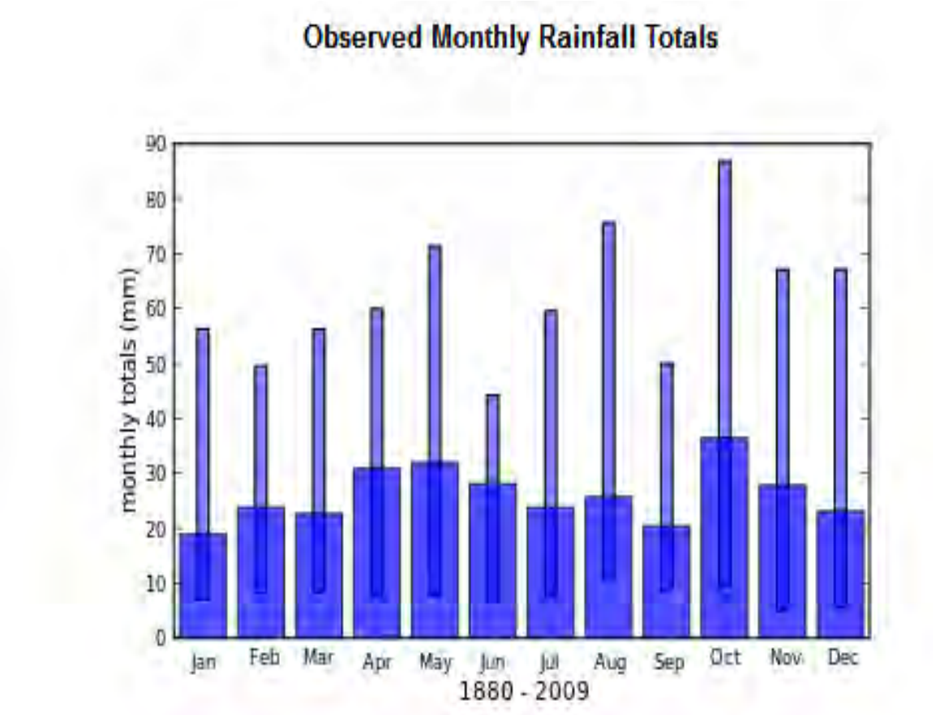

Figure 7: Monthly Rainfall Totals (Climate Information Portal, 2013)

3.1.3 Sunshine

The Mossel Bay Municipality is situated in a region that receives approximately on average between 10 and 20 overcast days, between 30 and 40 cloudy days, less than 100 fine days and less than 250 sunny days on an annual basis (Kruger & Esterhuyse 2005). The actual number of fine and sunny days shows the opposite amount of cloudy and overcast days experienced in the region. The most cloudy and overcast days are observed during the highest rainfall months and with the most fine and sunny days observed during the lowest rainfall months. The Mossel Bay Municipality receives approximately 2652 hours of sunshine per annum which equates to about 7.2 hours of sunshine per day (Kruger & Esterhuyse 2005). This approximation is line with the view that places in South Africa is blessed with abundant sunshine. This sunshine offers number opportunities, most notably in the use of solar energy as a renewable energy form and use of pleasant weather to attract tourists who seek favourable temperatures for their holidays (SAWB, 1996). The potential of solar energy in particular needs to be harnessed in order for the municipality to become more sustainable and less reliant on non-renewable energy sources for its energy supplies into the future.

3.1.4 Climate Change

Climate change is becoming an increasingly more important phenomenon to understand with regards to the long-term planning of cities and regions. As the impacts of climate change are considered to have substantial impacts on the functioning and livelihood of regions (IPCC, 2007). This makes it a fundamentally important to understand the challenges it will bring to Mossel Bay Municipality. The driving force for global climate change is primarily the rise of greenhouse gas concentrations in the atmosphere. Carbon dioxide, the principle greenhouse gas, is released to the atmosphere by the burning of fossil fuels, deforestation and conversion of land to agriculture (IPCC, 2007). Greenhouse gases absorb infrared radiation emitted from the earth's surface and heats the atmosphere. It is empirically proven that earth is hotter now than it ever has been in the past 1000 years (PGWC, 2005). Therefore it could be argued increased human activity is responsible for the altering of climate systems.

A number of climatic changes are predicted in the Western Cape based on climate model projections done by leading climatic agencies in the country. These changes include a drying trend from west to east, weakening of winter rainfall, increased summer rainfall, shift to irregular and greater intensity of rainfall and rising mean, maximum and minimum temperatures everywhere (PGWC, 2005). These changes will

have serious impacts not only on the ecological system of the Western Cape as well as the economic and social systems of the province. The biggest influence on the Mossel Bay Municipality from climatic change would be on the water resources of the municipality as currently the region receives so little rain it is severely dependent on alternative water supplies for its survival. Despite the limited supply of water resources, the demand for water resources continuous grows with rapid urban development and water thirsty development. This means that the decreasing amount of rainfall in areas that supply water for Mossel Bay Municipality will heavily impact water resources within the municipality. This will physically lead to reduced water availability; water retention and river recharge capacities from the lower amounts of water being supplied for the activities taking that place in Mossel Bay such as domestic use, industrial use and irrigation purposes. Hence it will impact the social and economic functioning of the municipality.

The increasing of mean maximum and minimum temperatures will lead to higher rates of evaporation on already meager water supplies therefore both lower rainfall and increased temperature will impact water resources in the municipality and this requires meticulous and strategic planning if the municipality will overcome climate change associated risks in the future. The greater intensity and irregular pattern of rainfall in the Western Cape will lead to increase the amount of floods and droughts occurring. It enormous difficult to predict exactly when these floods and droughts will take place however the destruction to physical infrastructure as well as loss of human life can be minimized if the municipality proactively acts against any dangers from floods and droughts (PGWC, 2005). For example establishing no-go areas for new development within 100m of a river and the coast (areas that are susceptible to flooding) will lead to many lives and millions of rands worth of infrastructure being saved. While establishing and implementing a water resource plan that advocates the use of grey water and water saving mechanisms will enhance the resilience of municipality in times of drought. The drought experienced in the Southern Cape region during 2009 and 2010 is consistent with the type of risks associated with climate change. When several towns including Mossel Bay came close to running out of water as rainfall stopped falling in the region with the lowest rainfall experienced in 134 years and declared a national disaster area (Perrier, 2011). This drought period was succeeded by severe flooding in the following year in 2011 which caused major destruction to the region. Only massive financial interventions by national treasury allowed the region to avert a full-blown crisis. This is the type of climatic related changes the municipality is likely to face in the future with increased frequency (Perrier, 2011).

3.2 Water Systems

Water resources and systems play an essential role in the functioning of the natural and human activities around the world and this no different in the Mossel Bay Municipality. Though the climate analysis revealed that the municipality does not receive much rainfall annually the municipality has important rivers, wetlands and part of the Indian Ocean within its water system. The Mossel Bay Municipality falls within the Gouritz Water Management Area (WMA), the Gouritz WMA covers an area of about 53 140 km^2 along the Southern Coast and Karoo areas of South Africa as figure 8 illustrates (DWAF, 2007).

Figure 8: Gouritz Water Management Area (DWAF, 2007)

3.2.1 State of Rivers and Wetlands

The quality of rivers and wetlands in the Garden Route area are reported to be in a good to fair ecological condition (DWAF, 2007). The good ecological condition of the health of the rivers and wetlands means that biodiversity and integrity remain largely intact with some human-related disturbance. The fair to good ecological conditions of the health of the rivers and wetlands mean that some sensitive species may be lost due to multiple disturbances related to socio-economic development as it would have been considered excellent to pristine if no degradation has taken place (DWAF, 2007). This means that these rivers and wetlands within the Municipality need to be continually protected and conserved to ensure that they remain in their present condition and have their condition improved as only a minimal amount of mismanagement can cause irreversible damage to the rivers and wetlands which will not only affect resources in the municipality but the entire Gouritz WMA as water systems are part of a larger interdependent hydrological system that do not have boundaries since water flows between different sub-areas and different water management areas.

3.2.2 Major impacts on Rivers and Wetlands

There are a number of major activities threatening the ecological condition of rivers and wetlands in the municipality. The rapid spread of invasive alien plants, mainly black wattle, which shades the river reduces the amount of sunlight available for maintaining aquatic biodiversity (e.g. indigenous plants, invertebrates and fish) (DWAF, 2007). Invasive alien vegetation also reduces water availability in this water stressed area since alien vegetation consume a greater amount of water than indigenous vegetation, reduces riparian habitat diversity since their larger water consumption leaves indigenous vegetation not having enough water for their own survival, destabilizes river banks and causes incised river channels that reduces channel carrying capacity and increases water flow rates (DWAF, 2007). Water abstraction and flow modification are a major threat to the health of these rivers. Water is abstracted from rivers in the Garden Route for a variety of uses. There are a large number of farm dams, while water for domestic purposes is largely run-of-river abstractions with off-channel storage. The cumulative effect of these water abstractions has modified flow. The impact on low flow is more severe, with some rivers ceasing to flow throughout the year. This results in water quality problems and fragmentation of habitat, which reduce the goods and services of these rivers (DWAF, 2007). Agricultural practices and urban development into floodplains and wetlands have reduced water quality and habitat diversity in the lower reaches of many rivers. Alien vegetation encroachment, bulldozing, pastures and developments in riparian zones have reduced the riparian zone's buffering function from surrounding land-use impacts, thus reducing its ability to remove nutrients and stabilize riverbanks.

3.2 3 Water Resource Infrastructure

Dams

There are two main dams supplying water in the Mossel Bay Municipality, one is the bigger Wolwedans Dam and the other one is the smaller Klipheuwel Dam. The Wolwedans Dam is owned and operated by the national Department of Water Affairs. The Wolwedans Dam has a storage capacity of 25.1 million m^3 and a yield of 11.3 million m^3. The Klipheuwel Dam is an off-channel storage dam, which comprises of water pumped from the Moordkuil River for supply to the Mossel Bay Municipality. These dams have a full supply capacity of 4.2 million m3. The capacity of these dams combined with the low rainfall per annum of municipality is inadequate to meet the demand of water in the Mossel Bay Municipality (DWAF, 2010). There has been a gradual increase in amount of water consumed in the municipality over the past 50 years while there has also been a gradual decrease in the amount of water available in the main dams to supply water this clearly indicates that the Mossel Bay Municipality is under tremendous pressure to meet the demand for water. The main drivers of water demand in the municipality are households and industry. Households are increasingly requiring larger quantities of water due to more households, increased standard of living and aesthetical use of water resources. Industry is increasingly requiring larger quantities of water due to increases in economic activity from demand which influences the water use practices of industry (DWAF, 2010).

Desalination of Sea Water

Desalination is the process of purifying sea water into fresh water in order to make it fit for human consumption it is a widely used technique in Middle Eastern Countries that have desert climates which receive less than 250mm of rainfall per annum and high temperatures that complicate the storage of surface water supplies (Miller, 2003). Mossel Bay Municipality has the largest desalination plant in South Africa; it has the capacity to supply 15 million litres of water per day to the Municipality and PetroSA the national oil company (DWAF, 2010). The selection of a desalination process for providing the municipality is a direct result of the low amount of rainfall it receives annually and after a period of severe drought the municipality was forced to seek alternative water sources for domestic and industrial use. This desalination plant comes at a cost of R200 million for the construction of the desalination plant which indicates it is not the most cost-effective of supplying water and would not have been feasible without contributions from the National Treasury and PetroSA (DWAF, 2010). The short and long-term effects that the desalination plant or future desalination plants will have on the local coastal ecosystem is not known at this point as this is a relatively new technology which means not much studies have been done on the impact of desalination plants.

3.3 Land Systems

The main features of the land system of the municipality can be divided into the following components firstly the topography, geology and soils of the region. With the Mossel Bay Municipality being located within the Western Cape and specifically in the Southern Cape region it shares many land characteristics with the entire province and region.

3.3.1 Topography

The topography of the municipality ranges from being 0m above sea level at the beach areas in the southern and eastern parts of the municipality to over 1000m in the Outeniqua Mountains in the northern part of the municipality. Therefore there is a gradual increase in elevation and relief in the municipality as one moves further inland towards the Little Karoo from the Garden Route coastline (See figure 9). The topography of any region influences the nature of development that can take place as areas with a flatter gradient is better suited to development compared to areas with a steeper gradient. Due to the flatter nature of the areas adjacent to the coastline, land at the coast on the eastern side of the municipality is significantly more suitable to development than land in the northern side of the municipality close to the Outeniqua Mountains which has a steeper gradient. The steeper gradient of the northern areas of the municipality limits major development in terms of settlement building taking place however the mountainous terrain is suitable for adventure activities such as hiking, mountain biking and rock climbing.

Figure 9: Topography Map of Mossel Bay Municipality (NGI, 2009).

3.3.2 Geology

The geology of the Mossel Bay Municipality is structurally defined by the Cape Fold Belt which forms the geology of the Cape Fold Mountain which is the dominant Mountain Range of the Western Cape that ranges from the Southern Cape to the West Coast of the province (Rust, 1999). The Southern Cape region is dominated by three sedimentary deposits: the Cape Supergroup, the Karoo Supergroup and the Uitenhage Group. The Cape Supergroup is divided into the Table Mountain Group, the Bokkeveld Group and Witteberg Group (Brink, 1981). The geology map of the Mossel Bay Municipality on figure 10 shows that the Table Mountain group is found in the northern mountainous areas of the municipality with the steep terrain of the Outeniqua Mountain not suitable for development. The geology map also shows that Uitenhage group is found mostly in the middle areas of the municipality where agriculture is the main economic activity which means the geology is suitable for farming and at the coast where all the urban areas of the municipality is found which means the geology is suitable for the construction of buildings (Rust, 1999). The other dominant geological formation of the municipality is comprised of Cape Granite Suite with granite being the dominant rock type of this formation it is also found in the middle areas between the coastal and the mountain on the eastern side of the municipality where towns have been established (Brink, 1981). The rest of the geology in the municipality is classified either as alluvium and sand as the geology map indicates which both suitable for development are. The overall structure of the geology of the municipality is conducive to development and does not serve as a constraint to possible development. Importantly there is very little seismic activity taking place in the municipality since there are no significant fault lines in the municipality meaning there is low chance of a major earthquake occurring (Rust, 1999).

Figure 10: Geology Map of Mossel Bay Municipality (DEADP, 2011).

3.3.3 Soils

There are four main soil forms found in the municipality according to the Soil Map of the Mossel Bay Municipality on figure 11 with each having distinct characteristics determining what type of agricultural activity is possible above it. The first form is Glenrosa and Mispah which is part of the Lithic soil group which is found on the western side of the municipality it has a fine sandy clay loam texture (Fey, 2010). The areas where glenrosa or mispah soils are found in the municipality are considered to be non-arable and have low grazing potential which means it is not suitable for agriculture. The second form is Grey Regic sands which is found in small areas of the municipality and forms part of the Cumulic soils group (Fey, 2010). The areas where grey regic sands are found are also considered to be non-arable and have little grazing potential therefore these areas can be disregarded for agricultural activity. The third form is Prismacutanic soils which forms part of the duplex soils group which is a group classified with high clay content. This soil has a strong structure in the Horizon B with having a fine sand texture (Fey, 2010). The areas where prismacutanic soils are found are considered to be arable and have moderate grazing potential which means areas with prismacutanic soils have the best agricultural potential in the municipality compared to the previous two soil forms. The fourth soil form is Red-Yellow Apedal which is found mostly in the northern areas of the municipality (Fey, 2010) and at the coast as well which are areas generally not suitable for future development but like primacutanic soils have marginal arable potential and moderate grazing potential. The spatialisation of the various soil forms in the municipality shows which areas in the municipality is not conducive for agricultural activity and which areas have potential for agricultural activity. Land in the central and eastern parts of the municipality is conducive for agricultural activity as the quality of the soil and land capability makes it feasible for agricultural production. While land in the western part of the municipality is not suitable for agricultural production as it considered to be non-arable with little grazing potential.

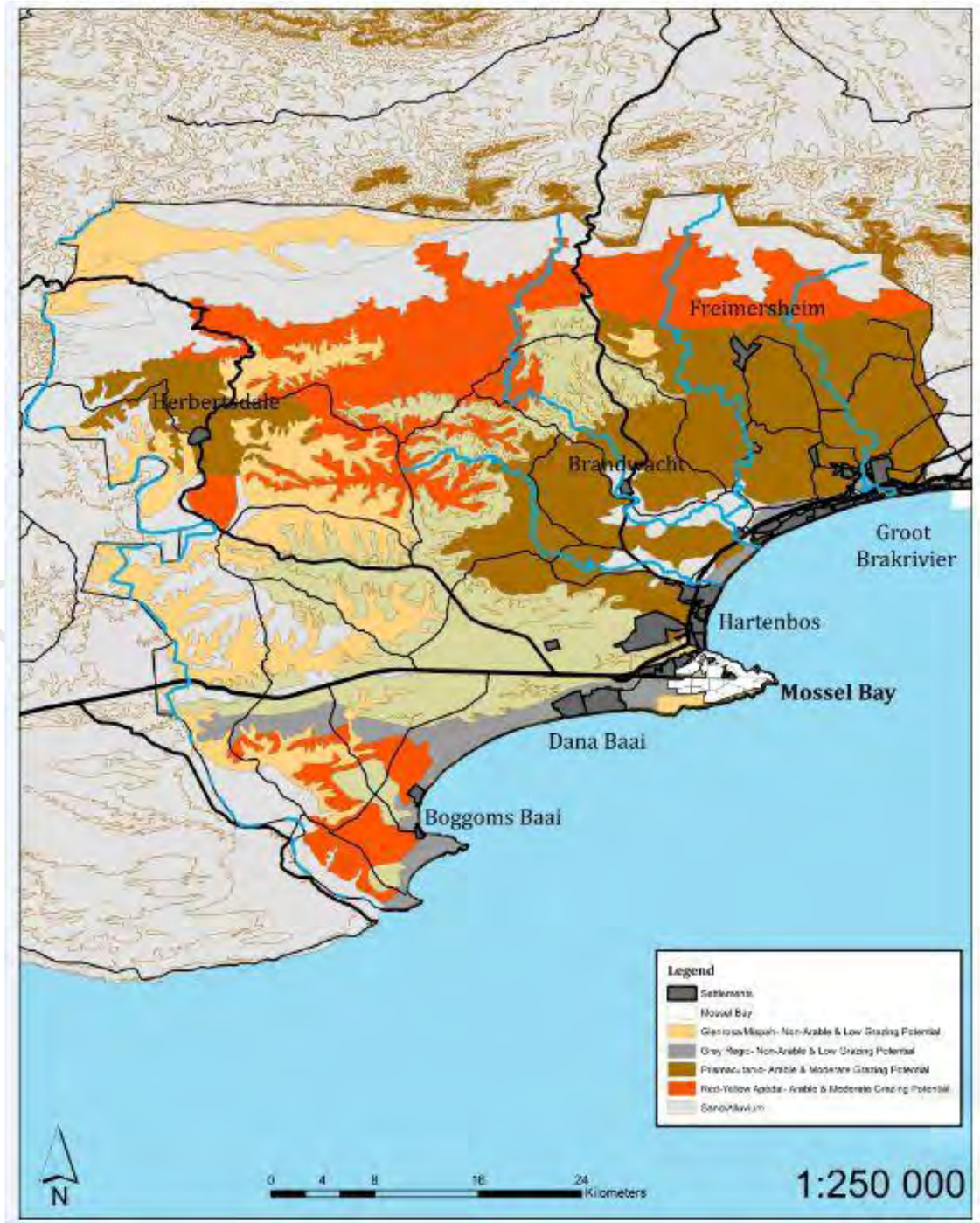

Figure 11: Soil Map of Mossel Bay Municipality (DEADP, 2011).

3.4 Biotic Systems

Biotic systems can be described as all the living organisms within a defined physical location. However with entire biotic systems crossing administrative boundaries it is increasingly difficult to understand the exact impact of the threats to biotic systems (Turner, 2012). Through a better understanding of the biotic system it can lead to better sustainable planning decisions which will increase the value that the ecosystem services of the biotic system offers to the entire Southern Cape region (Turner, 2012). With South Africa being considered the third most biologically diverse country in the world this highlights the importance of the biotic systems of the country (PGWC, 2005). The Western Cape hosts two globally recognized biodiversity hotspots the Cape Floristic Region (CFR) and the Succulent Karoo (PGWC, 2005).

3.4.1 Terrestrial Ecosystems

Terrestrial ecosystems comprise of all living organisms (both flora and fauna) and the land on which they live. They are distinguished from aquatic ecosystems by the lower availability of water and the consequent importance of water as a limiting factor (Maree & Vromans, 2010). With a major part of the Mossel Bay Municipality being part of the Cape Floristic Kingdom the municipality is home to flora sub-species that is not found in many places around the world. There are 19 different terrestrial ecosystems species found in the Mossel Bay Municipality with a large percentage of these species found only in the municipality (Maree & Vromans, 2010). The terrestrial ecosystem map of the Mossel Bay Municipality on figure 12 shows the location of terrestrial species in relation to settlements of the municipality. With a majority of settlements of the municipality located at the coast most terrestrial ecosystem at the coast have been degraded due to urban expansion while other terrestrial ecosystem species in the northern and middle parts of the municipality remain largely in good condition as these areas have not been subject to expansive urban development. Therefore areas in the middle and northern areas of the municipality with indigenous terrestrial species need to be protected from urban expansion and other activities which might impact the quality of the terrestrial ecosystems found in the municipality.

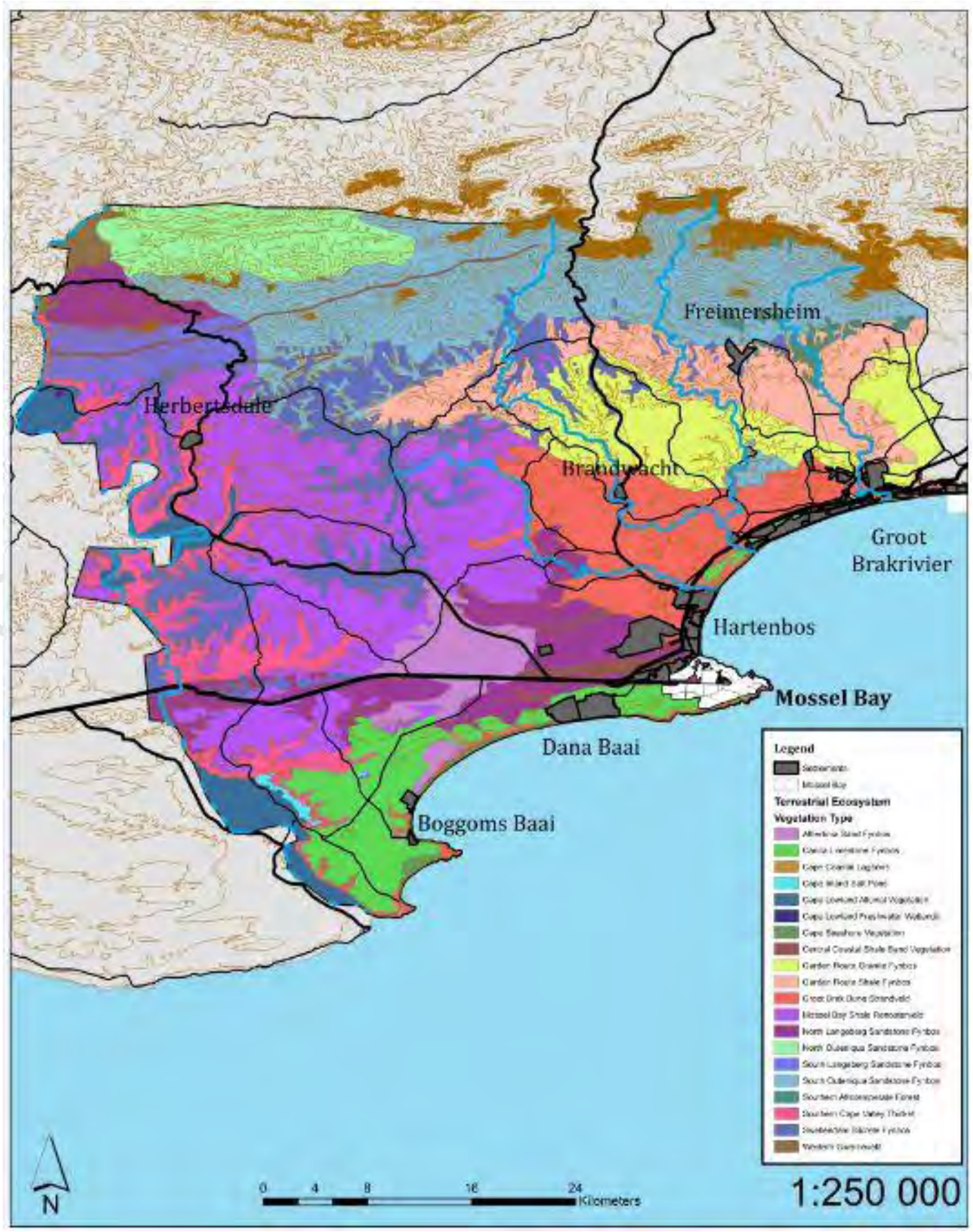

Figure 12: Terrestrial Ecosystem Map of Mossel Bay Municipality (SANBI, 2011)

3.4.2 Critical Biodiversity Areas

Despite the richness and value of the terrestrial ecosystem found in the municipality, species in this ecosystem are considered threatened with different ecosystems having different conservation status afforded to them. Together different government department and various environmental institutions have developed a system to classify these areas according to an ecosystem status and having these areas mapped to guide biodiversity planning to ensure the future well-being of such important biodiversity. Critical Biodiversity Areas are used to identify those areas which are most in need of conservation (i.e. safeguarding against irreversible loss of biodiversity and ecological degradation) (Maree & Vromans, 2010). The aim of this planning approach is to assist land-use management in aligning it with the biodiversity priorities and thereby ensuring sustainable development which is especially important in the face of climate change (Maree & Vromans, 2010). Critical Biodiversity Areas Map of the Mossel Bay municipality on figure 13 spatially indicates which areas in the municipality have ecosystems that are critically endangered, are endangered and are vulnerable to degradation. From the map it is clear that the middle areas of the municipality contain the most endangered and vulnerable ecosystems in the municipality and if these ecosystems are not robustly protected and conserved then the entire biotic system of the municipality and biotic systems elsewhere will cease to serve its original functions. This will result in irreversible damage to the natural environment which in turn negatively impacts the human environment. By protecting the biotic systems of the municipality it will ensure that the municipality adheres to the principal of environmental sustainability which is increasingly important as the municipality moves forward into the 21st century as it will be confronted by many naturally induced challenges and safeguarding the biotic systems of the municipality is one mechanism of making it more resilient to naturally induced challenges such as climate change, droughts and floods, etc.

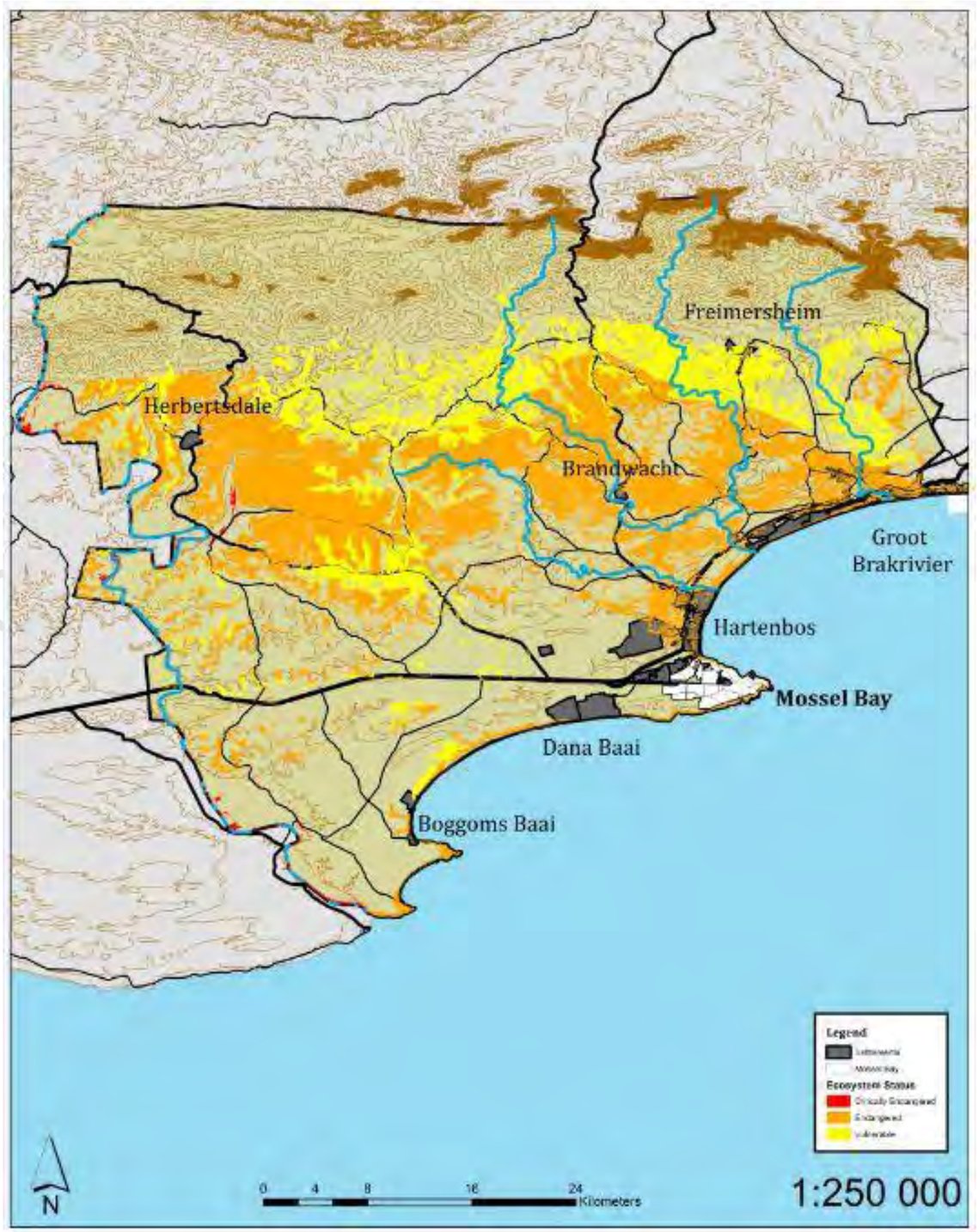

Figure 13: Critical Biodiversity Areas Map of Mossel Bay Municipality (SANBI, 2011)

3.4.3 Aquatic Ecosystems

Aquatic ecosystems comprises of both the living organisms and the non-living components in the surrounding water system. Aquatic ecosystems include wetlands, estuaries, lagoons, lakes, rivers and groundwater ecosystems. Because aquatic ecosystems are usually inter-related systems, activities which impact on one part of an ecosystem have consequences elsewhere (Maree & Vromans, 2010). For example, activities impacting the source of a river in the mountains, can affect the entire stretch of the river to the point where it enters the ocean. South Africa is a water-scarce country and our aquatic ecosystems are under severe pressure as a result of many competing demands on our limited water resources. All indications are that South Africa will reach its limit of potentially accessible water supplies between 2020 and 2030. For this reason, it is crucial that efficient water-use is encouraged, for example through demand control, recycling, re-use and rainwater harvesting. This means that aquatic systems will play an increasingly important role in the adaptation to climate change to ensure that the municipality has quality water supplies in the future (Maree & Vromans, 2010).

As mentioned in the water systems analysis section Mossel Bay municipality falls entirely within the Gouritz water management catchment area. This primary water catchment area represents the overall management area for water resources administered by the Department of Water Affairs. There are five rivers flowing in the Mossel Bay municipality (see figure 14). These rivers have been modified through heavy use and regulation to improve water security. Biodiversity in most of these rivers has been impacted by modification of river banks, and the spread of invasive alien plant and fish species. The well-being of the aquatic ecosystem is largely dependent on the health of the adjacent natural vegetation, which is termed the riparian or riverside habitat. This vegetation filters pollutants, helps maintain natural water temperatures, contributes organic matter which supports aquatic life and acts as a buffer against the impacts of adjacent land-use activities. Furthermore, the rooting systems of the indigenous riverside vegetation bind the river banks, reducing the effects of floods, preventing erosion and increasing water storage in the soil by slowing run-off during floods. The greatest threats to the health of aquatic ecosystems include irrigation return flows, upstream abstraction, alien plant invasion and urban development. Central to the health of the aquatic ecosystem is the proper management of rivers and wetlands (Pauw, 2009) which is what a designated river buffer zone intends to achieve by limiting development in river riparian areas to safeguard the future of aquatic ecosystem of the municipality.

3.4.4 Marine and Coastal Ecosystems

With Mossel Bay Municipality having approximately 50km of the 800km of Southern Cape coastline within its boundaries its coastline is subject to complicated oceanographic processes driven by the wind regimes (Lubke, 1999). The coastline is characterised by a rocky shoreline interspersed with bays, sandy beaches, dunes, rivers, estuaries and lakes (see figure 15). The south coast of South Africa has fairly high levels of ecological productivity and it is distinguished by having a very wide continental shelf, called the Agulhas Bank, which is home to several of the most important industrial fishery stocks (Lubke, 1999). This relatively shallow bank is of key biological importance, influenced by warm water plumes from the Agulhas current, as well as cold, nutrient-rich upwelling in places. As a consequence, sea temperatures and productivity on the Agulhas Bank are intermediate between those of the west and east coast marine systems. The area supports a variety of marine mammals, seabirds, deep water and open ocean fish, as well as shellfish which make up the marine and coastal ecosystem in the municipality (Lubke, 1999).

The biological conditions of the marine and coastline of the municipality represents aquaculture opportunities which can lead to the sustainable harvesting of endangered seafood species such as perlemoen as the municipality has the conditions for this environmentally sustainable practice. Furthermore the coastline of the municipality opens up the opportunity of harvesting seaweed which is naturally along on the municipality coastline. Unfortunately, the coastal and marine ecosystem is currently in a highly threatened state. This is attributed to human activities including petroleum mining, pollution, trawling, and over-abstraction of marine resources, coastal developments, non-extractive recreational activities, invasive alien species, climate change and mariculture (cultivation of marine organisms for food or other use). Formal protection of the marine resources is largely lacking and little is known about the marine animals and plants that occur there. All sectors, especially those involved in industry along this coast, should make every effort to safeguard the marine resources and to ensure their sustainable use as the destruction of the coastline will lead to the demise of one of the most important industries in the municipality, the tourism industry. The protection of the coastal areas is becoming increasingly important in the view of climate change and rising sea levels (Pauw, 2009) therefore the implementation of coastal protection zone can prevent future destruction of the coastline of the municipality and ensure the long-term use of its pristine beaches and marine-life.

Figure 14: Aquatic and Coastal Map of Mossel Bay Municipality (SANBI, 2012)

3.5 Material Flows

All countries, regions and cities around the world depend on natural or man-made resources for its survival. However, not all areas have the resources within its borders that are necessary for it to function and survive. This requires areas that do not have resources such as water, coal and fertile soil to import the outputs of these valuable resources in order for it function. The flow of various materials such as water, energy and food gives a good indication of the sustainability of the region since it can establish whether a region has a greater inflow of materials than outflow of materials. This is particularly important in an environmentally changing world as regions can no longer exclusively depend on natural resources from other areas for its functioning as the pressure of climate change will limit the ability of regions exporting materials such as water, energy and food in the future.

3.5.1 Water Flows

One of the most important resources that any region depends on to survive is water and it has been established that the Mossel Bay Municipality is water-scarce area in terms of its annual rainfall. It has been highlighted in the water systems section that the Mossel Bay Municipality has two main dams supplying water to the region. The main inflow of water in the municipality is therefore from rainfall, however after experiencing severe drought in the region the municipality was forced to seek alternative water resources as its annual dam yield was not enough to secure its long-term future as the dams were running dangerously low from years of minimal rainfall in the region. In spite of the total yield capacity of the dams in the municipality (approximately 15 million cubic litres) being higher than the demand, the low rainfall in the region meant that the actual yield supply (approximately 7 million cubic litres) of water from the dams barely matched the water demand of the municipality. Therefore though the municipality is obtaining water resources within its own borders through a natural means the ever-increasing demand of water became perilously close to overtaking the supply of water, this resulted in the whole water resource situation of the municipality being unsustainable. Looking at the annual water requirement scenarios graph of the municipality a desalination plant was earmarked for the year 2030 in order to meet the predicted demand of water but before 2030 a number of intervention options were scheduled to incrementally meet the demand however the low rainfall years and subsequent drought meant those inventions were not feasible as it required increased rainfall which was not forthcoming. The municipality in conjunction with various stakeholders fast-tracked the development of a desalination plant as a means of supplying water to the municipality permanently since the municipality is located at

the coast where there is a constant supply of seawater. The desalination plant was the only alternative that was not dependent of rainfall occurring. The construction of the R200 million desalination plant has resulted in an additional 15 million litres of water being supplied to the municipality on a daily basis in 2012. According to the Town Planner of the municipality there is an incremental upgrading plan for the desalination plant should annual rainfall in the region further decrease or should the municipality face more prolonged periods of drought. The desalination plant has improved the dire water resource situation of the municipality but has not decreased the demand of water resources as water resource usage continues to increase.

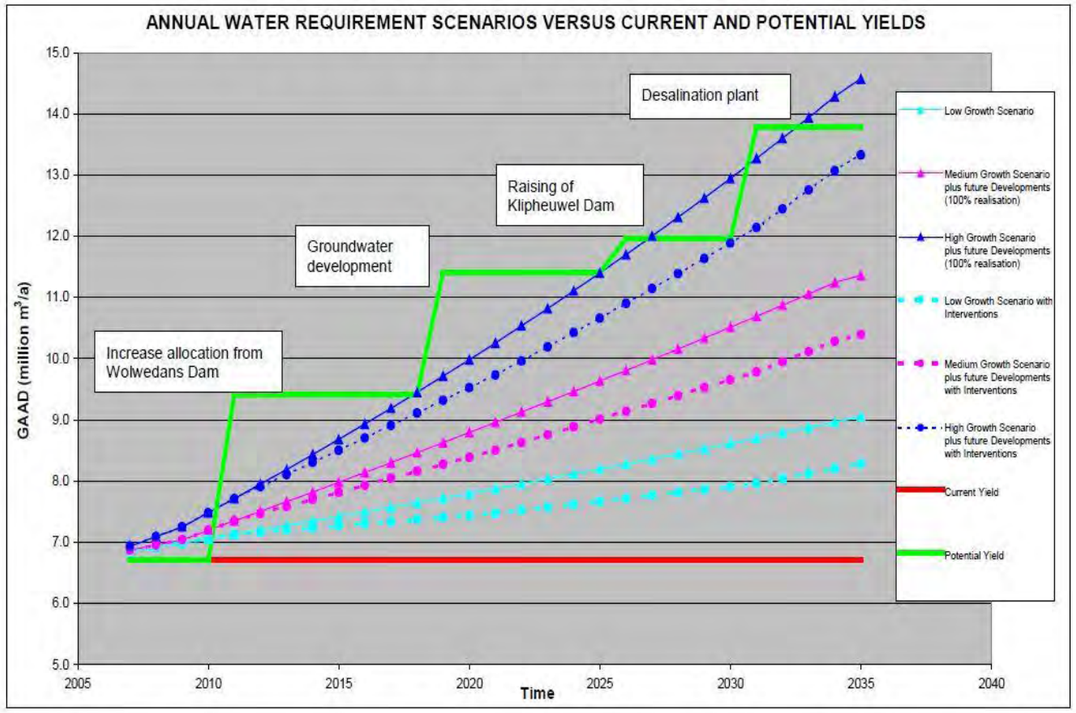

Figure 15: Annual Water Demand Scenarios of the Mossel Bay Municipality (DWAF, 2010)

The annual water requirement scenarios graph of the municipality on figure 15 shows that by 2035 water demand will have doubled from 2007 if the municipality follows a high growth scenario. This indicates that the water flow system of the municipality is totally dependent on converting seawater into freshwater through the reverse osmosis process which the desalination plant performs without the desalination plant the municipality will simply not be able to meet the water demands presently or in the future. The supply of seawater from the Indian Ocean is lifeblood of the Mossel Bay Municipality and it is assumed that this will be a steady supply for water for the next 100 years as the systems approach imply water exists in one form or another and does not get created or destroyed.

3.5.2 Energy Flows

Like water flows, energy flows are essential for the functioning of the municipality. The flow of energy into and out of the municipality as well as its consumption and transformation acts as one it's of the main flow material systems, providing the fuel needed for all of the other systems to operate off of. The energy inputs into and outputs of any region can be divided into two primary sources, renewable and non-renewable sources. Renewable energy sources include solar energy, wind energy and water. Non-renewable energy sources include the conversion of natural energy into transmittable and shippable energy forms, therefore fossil fuels like coal, gas and oil and processed wood are the sources of energy used in the municipality. Two national companies play integral roles in the supply of electricity in the municipality they are PetroSA (South Africa's National Oil Company) and Eskom (South Africa's largest producer of electricity) with PetroSA being responsible for the production of synthetic fuels from offshore gas at one of the world's largest gas-to-liquids (GTL) refineries which located in the municipality as well as providing the gas for the Gourika Gas Power Station which is also located in the municipality and operated by Eskom.

The Gourika Gas Power Station became fully operational in 2008 in response to the electricity crisis the country was facing from decades long under-investment in the country's electricity infrastructure. Much like the construction of the desalination plant the gas power was relatively quickly constructed with a number of stakeholders such as Eskom and National Treasury fast-tracking the development of the gas power station. The Gourika Gas Power Station has a total capacity of 700 megawatt (MW) which is supplied with gas extracted from the PetroSA offshore gas plant. Therefore the generation of electricity consumed in the municipality is primarily from non-renewable sources which are finite and not environmentally sustainable as the production and consumption of these energy sources release carbon dioxide and other greenhouses into the atmosphere which is accelerating the effects of climate change. The consumption of electricity in the municipality is not sustainable nor environmentally friendly which puts the long-term future of the municipality at stake since it cannot guarantee the long-term supply of electricity from gas and coal.

Due to an increasing reliance on non-renewable energy sources for the production of electricity coupled with the government of South Africa signing international agreements such as the Kyoto Protocol and Doha Amendment to the Kyoto Protocol which commits the country to reduce the amount of emissions of greenhouses has opened up the commitment of national government supporting renewable energy generating projects. This has resulted in many studies being done on the feasibility of renewable energy projects in the country. One such project that has been deemed feasible through scientific studies in the form of a wind farm has been identified in the Mossel Bay Municipality with the facility capable of generating a maximum of approximately 80MW (see figure 16). The wind farm has recently received approval from the Western Cape Government with construction of the wind farm to commence in 2014 after the bidding process has been completed. With the municipality receiving over 300 days of sunshine per annum it opens up the possibility of generating solar energy in certain parts of the municipality. Especially in areas that have limited agricultural and human development potential. Through conducting feasibility studies on the potential yield of solar energy on land that is not productive in the municipality will open up the municipality to more renewable energy generating sources. These types of projects will lead to a greater sustainability in the material flows of energy in the municipality as they are generated within in the municipality through utilising natural flows of energy unlike the current way of producing electricity.

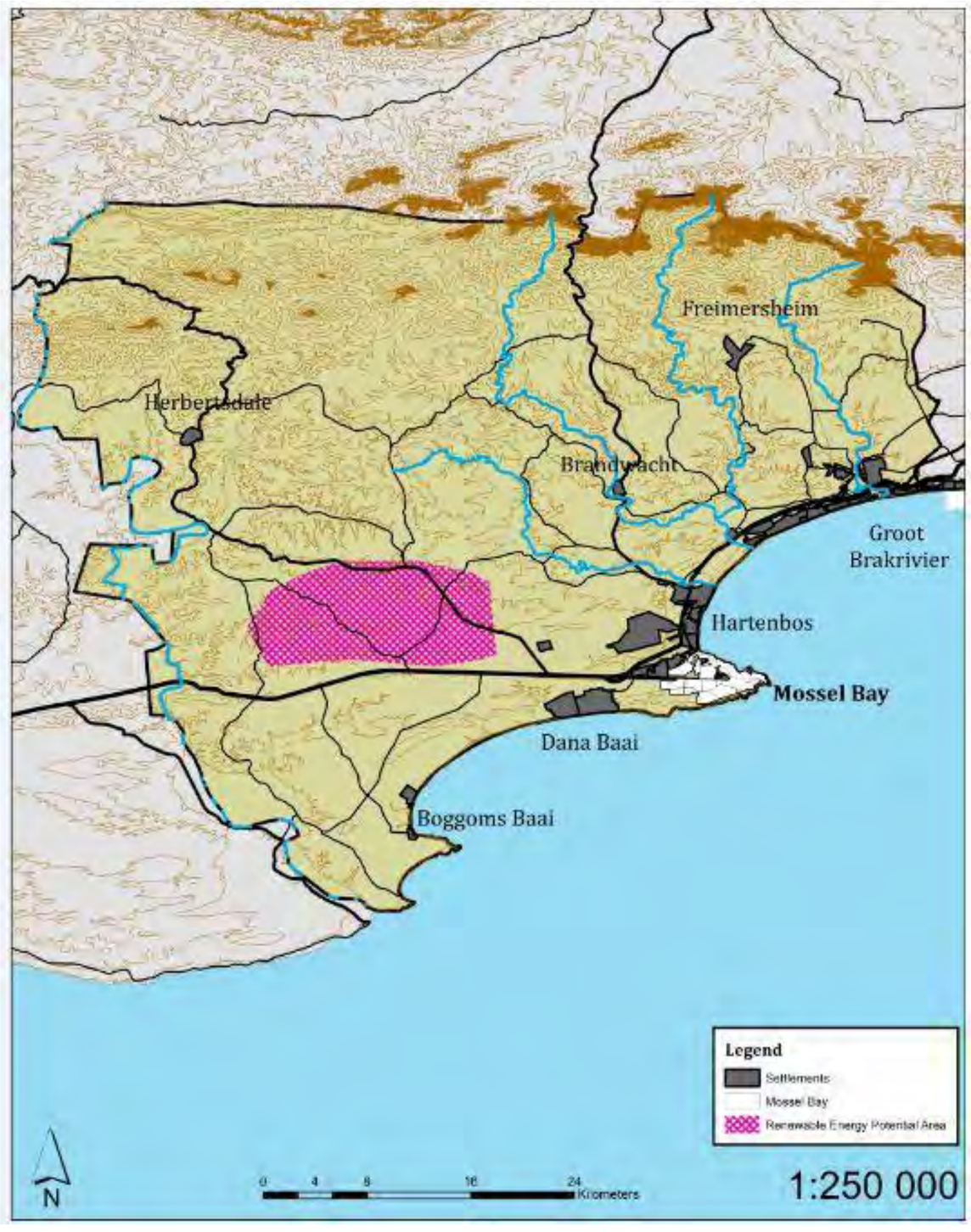

Figure 16: Potential Renewable Energy Area in the Mossel Bay Municipality

3.6 Environmental Synthesis

The Environmental Synthesis Map on figure 17 spatialises the main environmental opportunities and constraints that exist in the Mossel Bay Municipality. The topography of the municipality is both an opportunity and constraint to development; the steep topography found in the northern mountainous areas is an opportunity in terms of providing adventure–seeking tourists with outdoor activities such as hiking and rock climbing as it creates challenging conditions for adventure tourists to navigate through. While it is a constraint in terms of human settlement since it is expensive and difficult to develop land for human use on steep slopes. In terms of the opportunities from the soil of the municipality, areas in the municipality that have prismacutunic soils has the most potential for crop and livestock farming and these soils are predominantly located in eastern rural parts of the municipality. The aquatic and coastal ecosystem of the municipality is a severe constraint to development as the coastline, rivers and estuaries play an important role in the natural functioning of the municipality and development in the aquatic and coastal ecosystem will permanently alter the functioning of the ecosystem. This means the aquatic and coastal ecosystems of the municipality need to be protected. The coastline however has the potential to attract a huge amount of tourists to the municipality as the coastline has a number of beaches which is attractive for beach seeking tourists. The critical biodiversity areas of the municipality is another significant constraint to development as the plant and animal species found in the municipality forms part of the world renowned Cape Floristic Region. These plant and animal species are classified according to their ecosystem status and with large areas classified as endangered and vulnerable highlights the fragile nature of the natural environment in the municipality. The degradation of critical biodiversity areas from development will cause an environmental catastrophe since all other biotic ecosystems will be affected therefore is it imperative that the critical biodiversity areas is protected from new developments. There lies significant opportunity to improve the currently unsustainable material flow system of the municipality by harnessing electricity from renewable energy by sunlight and winds. By harnessing electricity from a renewable energy means will significant improve the resilience of the municipality as it reliant on finite non-renewable resources for its electricity supply. The utilisation of renewable energy can guarantee the long-term supply electricity for the municipality which is essential for social welfare, economic growth and human development.

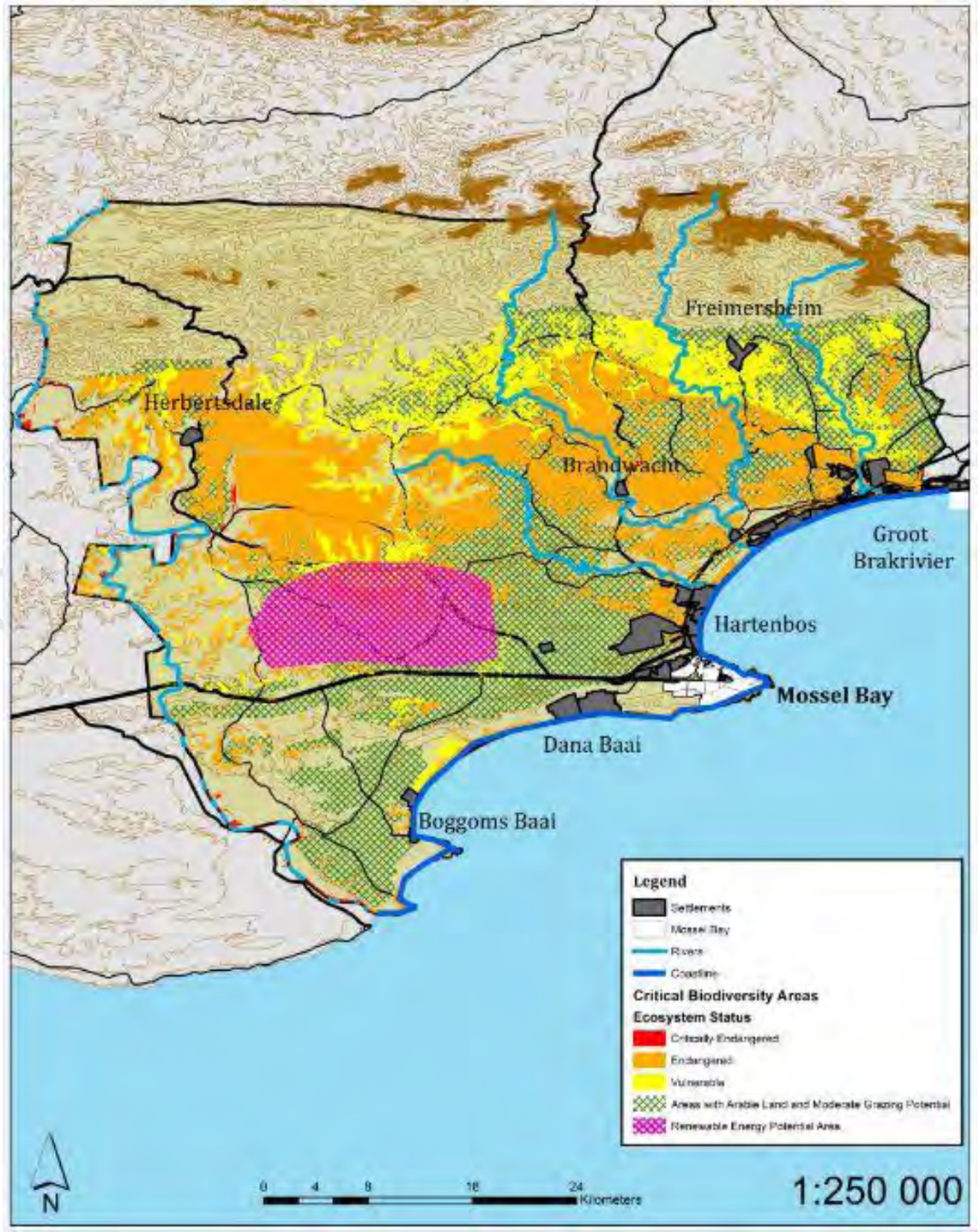

Figure 17: Environmental Synthesis Map of the Mossel Bay Municipality.

4. Human Settlement Analysis

This chapter is an analysis of the human settlement systems of the Mossel Bay Municipality. This chapter deals with the various elements of the human settlement system including population, social welfare and economy, settlement and infrastructure and institutional arrangements. It then concludes with a synthesis of the human settlement opportunities and constraints that exists in the municipality based on the findings from the analysis.

4.1 Population

4.1.1 Population Growth

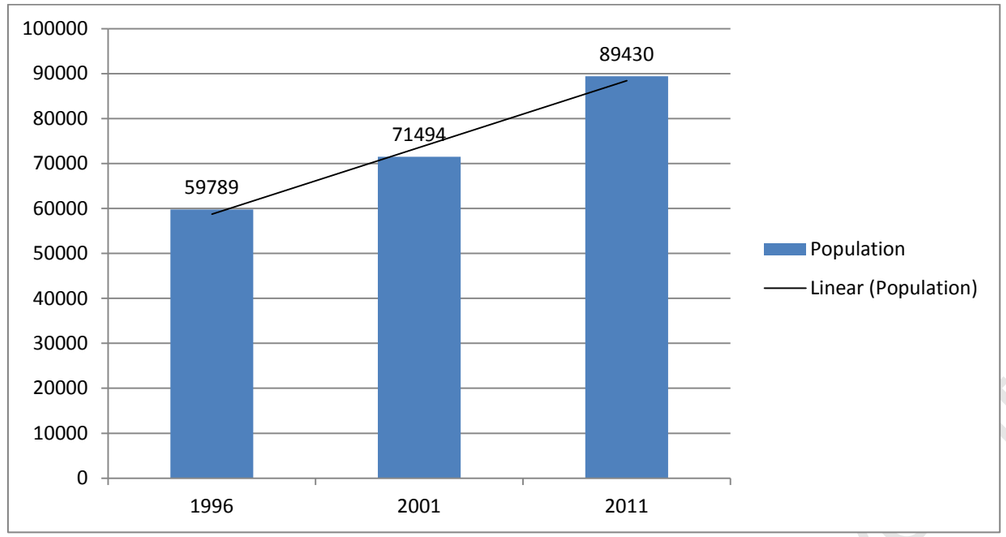

Figure 18: Population Growth of the Mossel Bay Municipality (Stats SA, 2012b)

The population of the Mossel Bay Municipality has been growing gradually over the past fifteen years as figure 18 indicates a positive linear population growth between 1996 and 2011. Between 2001 and 2011 there had been a decrease in the population growth rate as the growth rate dropped to 2.2% over the ten years from 3.5 % between 1996 and 2001. The population therefore grew from 71 494 to 89 430 within a ten year period. The positive linear population growth of the municipality is in line with national, provincial and district trends with population increasing albeit there being a slowing population growth rate between 2001 and 2011.

4.1.2 Population Pyramid

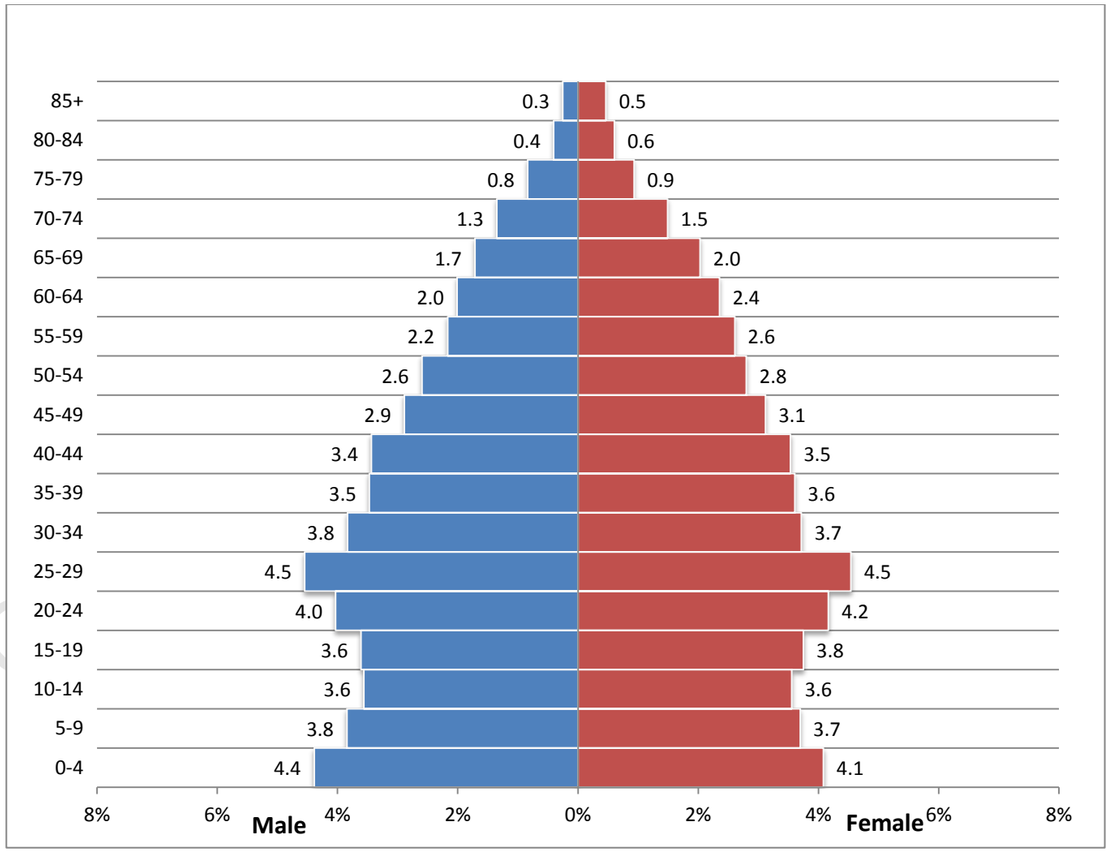

Figure 19: Population Pyramid of the Mossel Bay Municipality (Stats SA, 2012b)

The population pyramid of the Mossel Bay Municipality on figure 19 reveals that the municipality has a nearly even split between the young and older age-groups. With the young population (persons under the age of 30) making up 47.8 % of the total population while the population over the age of 30 makes up 52.2% of the total population. The population pyramid of the Mossel Bay Municipality also reveals that there is 49:51 split between the percentage of males and females which shows that gender is almost perfectly balanced in the municipality (Stats SA, 2012a). The dependency ratio of the Mossel Bay Municipality was 48.67% in 2001 this has increased to 49.73% in 2011 meaning that more people between the ages of under 15 and over 65 have become dependent on the economically active population (between 15 and 64) of the municipality (Stats SA, 2012a). The increase of dependency ratio of the Mossel Bay Municipality does not bode well for the future of the municipality as it has negative implications on the economy and social sectors of the municipality.

4.1.3 Urban-Rural Population

According to the 2011 Census, 76 890 people lived in the five urban towns of the municipality. Urban towns in the municipality include Mossel Bay which had a population of 57 448, Grootbrak Rivier with 10 619 people and Hartenbos with 4 196 people (Stats SA, 2012c). Other urban towns with populations slightly above 2 000 people include Dana Baai and Kleinbrak Rivier. Rural towns in the municipality include Brandwag, Herbertsdale and Friemersheim with populations slightly above 1 000 people (Stats SA, 2012c). The 76 890 people equates to 86% of the municipality living in urban areas which means 14% lived in rural areas which means the municipality is highly urbanised. This represents a 17% increase in the urbanisation level of municipality between 2001 and 2011 which stood at 69% in 2001. The urbanisation level of the municipality is significantly higher urbanisation level compared to national urbanisation level which stands at 62% and slightly below the provincial urbanisation level of 90%. Urbanisation trends of South Africa and the Western Cape indicate an increasing urbanised population in the country and province in the future as people move to urban areas in search for better opportunities to improve their lives as it is perceived urban areas have greater social and economic opportunities (Stats SA, 2012a) therefore it can be presumed that the urbanisation level of the Mossel Bay Municipality will continue to increase in the future.

4.2 Social Welfare

One of the most important indicators of the functioning of any region is the social welfare of the population. The social welfare section is divided into the education, health, employment and poverty levels in the municipality.

4.2.1 Education

One way of understanding educational levels of a region is through its literacy rate. Literacy rates indicate a minimum education level attained; a simple definition of literacy is the ability to read and write, requiring a minimum of 7 years of formal education. According to the Western Cape Department of Education, the Mossel Bay Municipality had a literacy rate of 81.09% in 2010 as the table below indicates (PGWC, 2011b). Furthermore it shows that the municipality has the highest rate in the Eden District Municipality.

Municipality	**Literacy Rate**
Kannaland Municipality	65.64%
Hessequa Municipality	67.49%
Mossel Bay Municipality	81.09%
George Municipality	79.03%
Oudtshoorn Municipality	74.48%
Bitou Municipality	77.57%
Knysna Municipality	79.59%
Eden District Municipality	75%

Table 1: Literacy Rates in the Eden District Municipality (Department of Education, 2011)

Education Levels

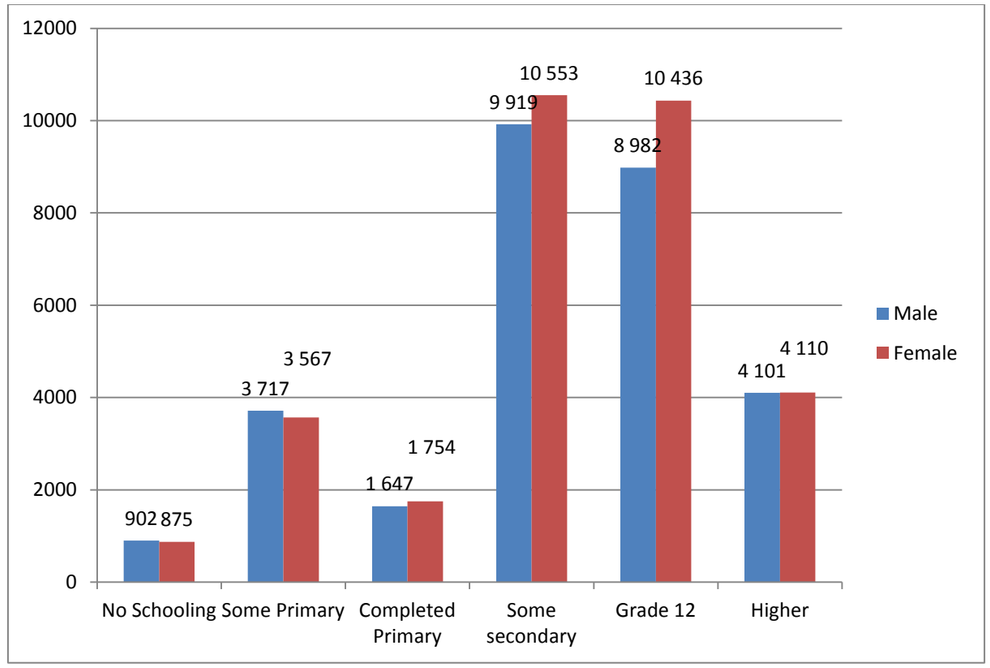

Figure 20: Educational Attainment of People above 20 years of age in Mossel Bay (Mossel Bay IDP, 2012)

Figure 20 above shows the educational attainment of people above the age of 20 in the Mossel Bay Municipality. 54.3% of people above the age of 20 have no formal education qualifications which means the majority of people are lowly skilled. Therefore the relatively high literacy rate does not translate into a highly skilled population. According to the Town Planner there is shortage of skills amongst the young people of the municipality which is preventing them from participating in the economy of the municipality. This is attributed to the low number of tertiary level education institutions in the municipality as there is only one satellite Further Education and Training facility named the Southern Cape Further Education and Training College in the municipality. This offers courses in office administration, marketing, building and civil construction, engineering and related design, electrical infrastructure construction, information technology and science and manage assistant programmes. Therefore an additional tertiary level education facility is required to improve the skills levels of people over the age 20, this tertiary level education facility will need to offer courses which builds the type of skills required in the economy of the municipality in order for the economy to grow.

Education Attendance

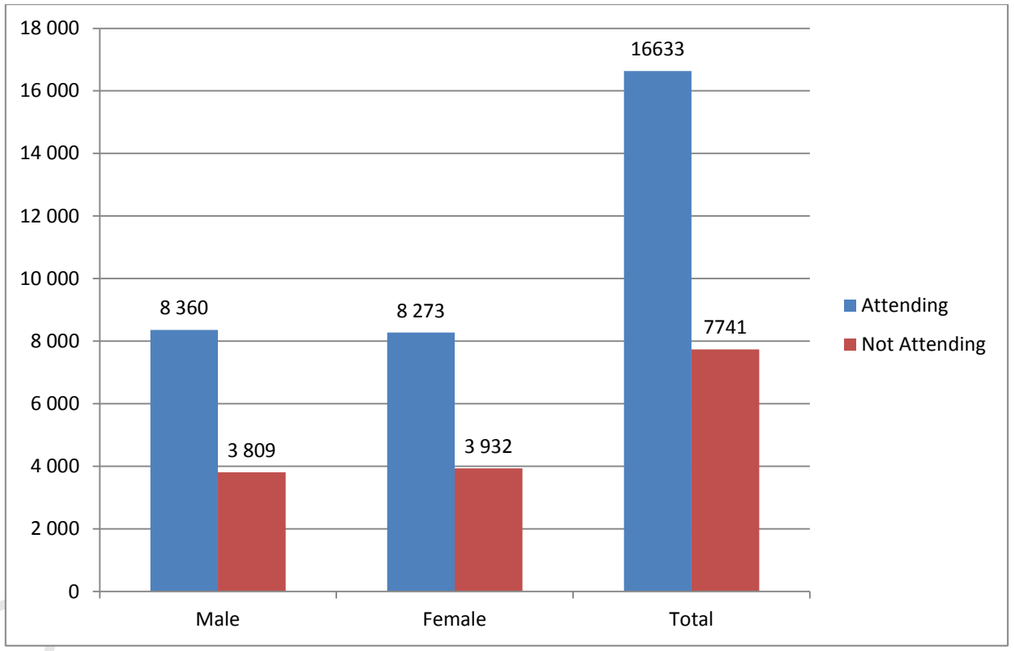

Figure 21: Enrolment in Educational Institutions of people between 5 and 24 years (PGWC, 2011b)

Figure 21 above shows how many persons between the ages of 5 and 24 were enrolled in an educational institution in 2011. According to the 2011 Census, 68.2% of persons between the age of 5 and 24 are enrolled in an educational institution while conversely 31.8% do not attend any form of educational institution (Stats SA, 2012c). There are 22 primary schools and 5 secondary schools located in the Mossel Bay Municipality (PGWC, 2011a). 27 schools for 27 265 persons below the age of 19 equates to one school per 1009 scholars in the municipality. This high scholar per school ratio means that the quality of education received in the municipality is diluted as classes are overcrowded. Overcrowded classes' impacts the ability of teachers to effectively do their job as it is difficult to control large numbers of young people which mean the performance of the scholars are impacted in the long-term. In order for the quality of basic education in the municipality to be increased more schools and smaller classroom sizes are required as this can be achieved through the building of new schools and upgrading of existing schools.

4.2.2 Health

Like education, the health of the population in a region is a major determinant of the quality of life people are leading. This means healthcare services is vital to achieving and maintaining a high quality of life. A diverse range of factors play a role in ensuring the good health of communities and that disease, especially preventable and communicable ones, are kept at bay. It is the function of healthcare services not only to restore bad health, but also to ensure that communities do not contract preventable diseases.

Access to Healthcare

Municipality	Community Day Centres	Clinics	Satellite Clinics	Mobile Clinics	District Hospitals	Regional Hospitals	Total
Kannaland	0	3	0	2	1	0	6
Hessequa	0	5	2	3	1	0	11
Mossel Bay	0	4	5	5	1	0	15
George	2	8	1	5	0	1	17
Oudtshoorn	1	5	0	3	1	0	12
Bitou	1	3	2	1	0	0	7
Knysna	0	6	1	3	1	0	11

Table 2: Healthcare Facilities in the Eden District Municipality (PGWC, 2011c)

Table 2 above indicates the access to health facilities in the Mossel Bay Municipality. In 2010, a total of 82 public healthcare facilities were located within the Eden District, of which 15 were located in Mossel Bay Municipality (PGWC, 2011c). The 15 public healthcare facilities comprise of 4 clinics, 5 satellite clinics, 5 mobile clinics and 1 district hospital. There was a total of 10 doctors and 57 professional nurses employed by the Department of Health to render health services to patients attending the 15 public healthcare facilities in Mossel Bay in 2010 (PGWC, 2011c). 15 public healthcare facilities equate to 1 healthcare facility for 5 962 persons in the municipality which is not ideal for primary healthcare as this creates enormous backlogs for people seeking healthcare in the municipality since there are long waiting lines for persons to see doctors which means not all people can access essential healthcare.

Figure 22: Distribution of Social Facilities in the Mossel Bay Municipality (Stats SA, 2012)

Figure 22 shows the distribution of social facilities such as healthcare and educational facilities in the Mossel Bay Municipality. It is clear that most basic public facilities are concentrated in the eastern and coastal areas of the municipality where majority of the people in Mossel Bay Municipality reside. There is an urban bias in the provision of basic public facilities as only 8 schools and 3 healthcare facilities are provided in the rural areas of the municipality compared with 19 schools and 12 healthcare facilities in urban areas. Therefore there is a higher level of access to healthcare and education in urban areas compared with rural areas. With the demographic analysis revealing an increasing urbanised population in the municipality, future basic public facilities are likely to be in urban areas as demand in urban areas will be much greater than demand for these facilities in the rural areas where population numbers are declining. This means auxiliary healthcare and education services such as mobile clinics will need to be implemented to ensure rural people have access to basic public services.

4.2.3 Employment and Unemployment

According to the 2011 Census, the Mossel Bay Municipality had a labour force of 33 535 people (Stats SA, 2012c). This labour force can be describe as the economically active people which are people between the ages of 15 and 65 years who choose to participate in the labour market.

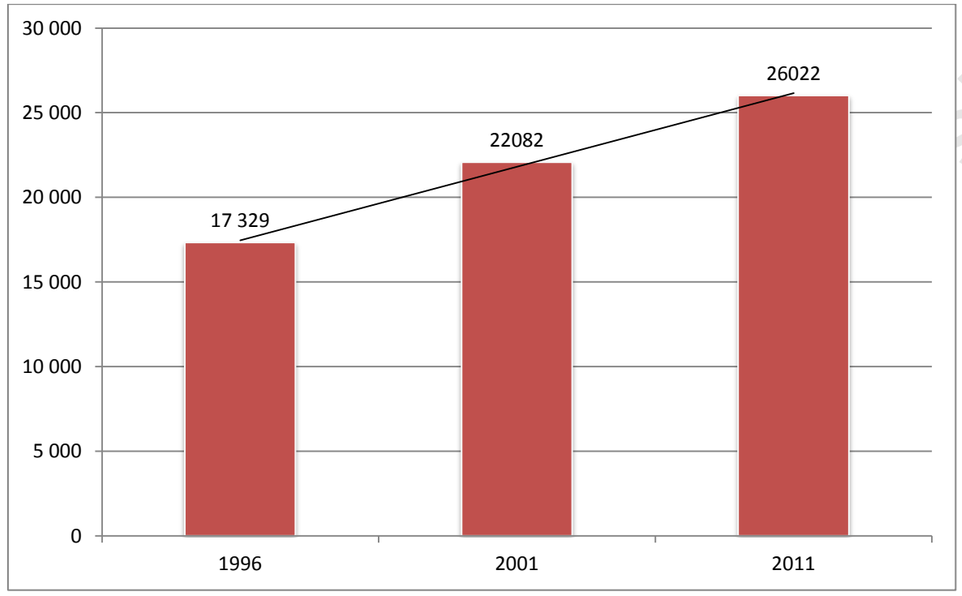

Figure 23: Number of Employed Persons in the Mossel Bay Municipality (Stats SA, 2012c)

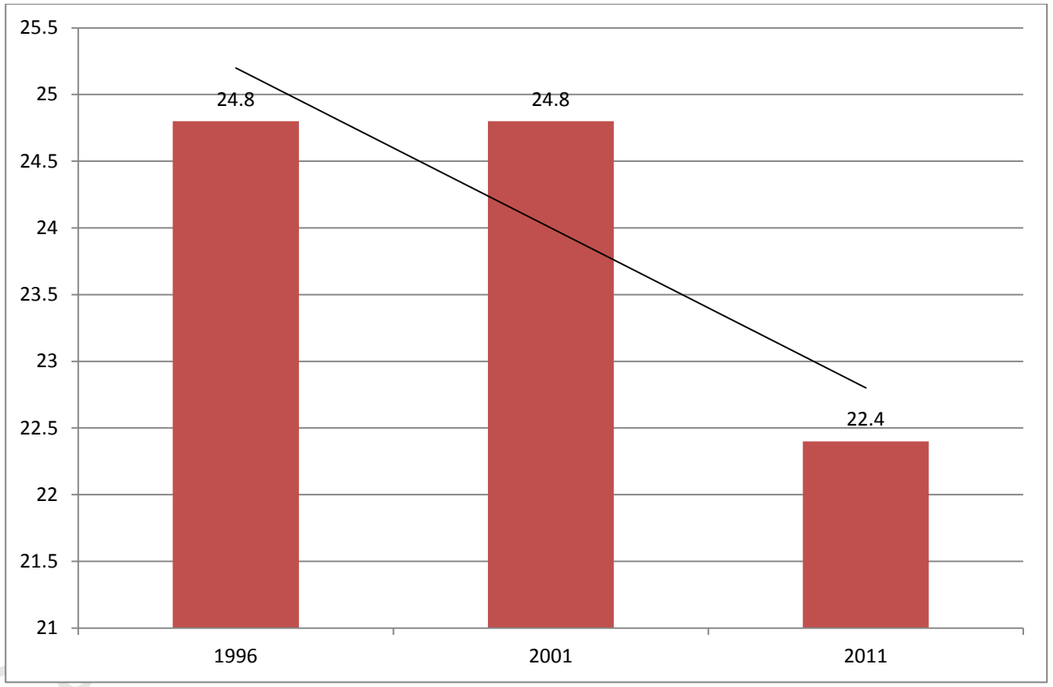

Figure 24 Unemployment Rate of the Mossel Bay Municipality (Stats SA, 2012c)

Figure 23 shows the number of people employed in the Mossel Bay Municipality while figure 24 shows the unemployment rate of the municipality. There has been a gradual increase in the amount of people employed over the past 15 years in the municipality which is reflected by the unemployment rate dropping over the same period. Despite the increase in the number of people employed and unemployment rate dropping in the municipality there remains high unemployment numbers and rates amongst the young people of the municipality. Persons between the ages 18 and 35 in the municipality represents 70% of the total unemployed persons in the municipality. According to the Town Planner the soaring youth unemployment rate is a national and provincial problem which filters down to the municipality therefore the problem of youth unemployment needs to be urgently tackled to ensure the well-being of the people in the municipality as the problem will only be exacerbated in the future as the population ages. The problem emanates from the low skill levels of the young people in the municipality as once they leave school they are ill-prepared to contribute to the economy as they are not properly educated nor is there is an entrepreneurial culture amongst the young people of the municipality.

4.2.4 Poverty and Inequality

By understanding the level of poverty and inequality in the municipality it will provide statistical evidence that invention is required in specific communities of the municipality. Two statistical instruments are internationally used to determine the levels of poverty and inequality within a region. One is the Human Development Index which is a composite, relative index that attempts to quantify the extent of human development of a community. Therefore the closer the HDI is to one the greater the quality of life (PGWC, 2011d). The second is the The Gini coefficient which is a summary statistic of income inequality, which varies from 0, in the case of perfect equality, to 1 which indicates high inequality (PGWC, 2011d).

The Human Development Index (HDI) of the Mossel Bay Municipality has been increasing between 2001 and 2010. The HDI in 2001 was 0.68 and rose to 0.72 in 2010 (PGWC, 2011d). This indicates that the quality of life for people is greater today than what it is was 13 years ago. Figure 25 is a map showing the HDI for municipalities across the Western Cape. It reveals that the Mossel Bay Municipality has one of the highest HDI in the province and the highest HDI in the Eden District Municipality. In order for the municipality to remain having one of the highest HDI there continuously needs to be improvement in the levels of quality service provision in the future.

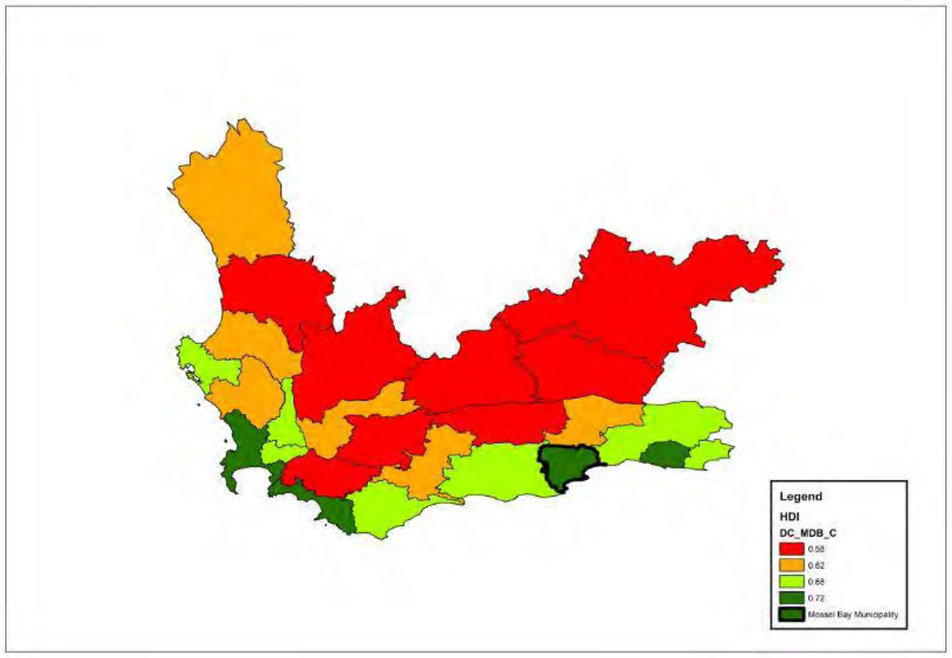

Figure 25: Human Development Index of the Western Cape (PGWC, 2011d)

The Gini Coefficient of the Mossel Bay Municipality has been decreasing between 2001 and 2010, from 0.58 in 2001 to 0.52 in 2010 (PGWC, 2011d). This indicates that the level of inequality in the municipality slightly decreased over the past decade however there still remains a relatively high level of income inequality. Figure 26 is a map showing the Gini Coefficient of municipalities across the Western Cape. Like the HDI of the municipality, the Mossel Bay Municipality has one of the lowest Gini Coefficients in the province and one of the lowest in the Eden District Municipality. There remains much work ahead to lower the Gini Coefficient of the municipality further in the future.

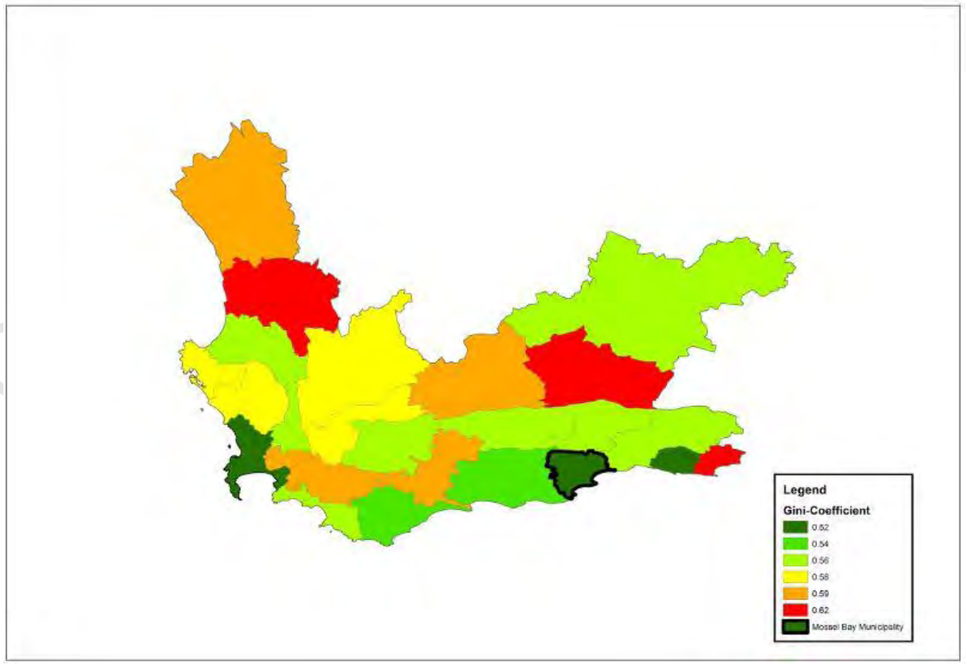

Figure 26: Gini Co-efficient of the Western Cape (PGWC, 2011d)

The number of people living in poverty in the municipality can be determined using the poverty rate. The poverty rate represents the percentage of people living in households with an income less than the poverty income. The poverty income is defined as the minimum monthly income needed to sustain a household and varies according to household size, the larger the household the larger the income required to keep its members out of poverty. The poverty income used is based on the Bureau of Market Research's Minimum Living Level (BMR report no. 235 and later editions, Minimum and Supplemented Living Levels in the main and other selected urban areas of the RSA, August 1996). For example, the monthly income needed to keep a one person household out of poverty in 2010 is estimated to be R1 315, while for a two person household it is R1 626; a four person household requires an estimated

income of R2 544 to stay out of poverty while a household with eight or more person requires an estimated R4 729. Using that specific poverty datum, the percentage of people living in poverty in the Mossel Bay Municipality decreased from 27.3% in 2001 to 12.4% in 2010. The number of indigent households in the Mossel Bay Municipality totalled 6 929 out of 28 655 households in 2010 in the municipality which are households living below the poverty line.

4.2.5 Households

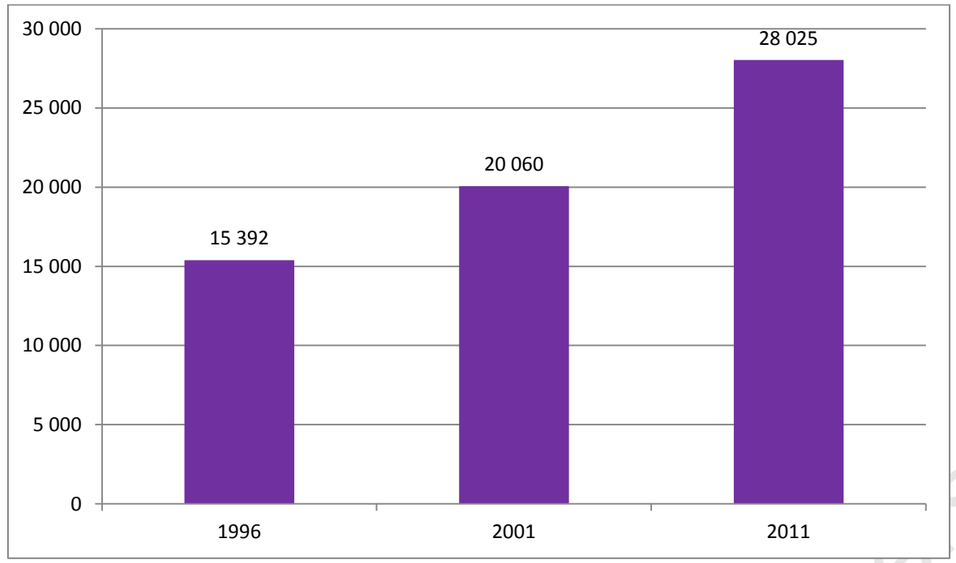

Figure 27: Number of Households in the Mossel Bay Municipality (Stats SA, 2012b)

Figure 27 shows that there's has been a steady increase in the number of households in the municipality between 1996 and 2011 with their being 28 000 households in the municipality and 24 000 living in formal dwellings means there a housing backlog for 4 000 households (Stats SA, 2012b). The increase in the number of households is directly proportional to increase in the population of the municipality. Despite their being an increase in the population size and number of households in the municipality Figure 28 shows that the average household size of the municipality has decreased during the same period (Stats SA, 2012b).

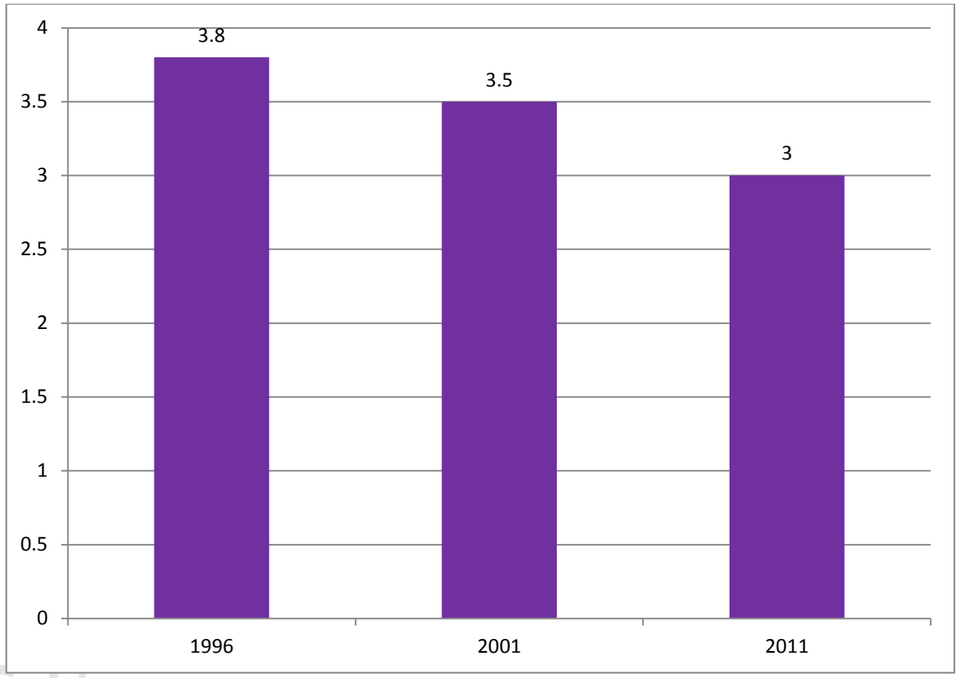

Figure 28: Average Household Size in the Mossel Bay Municipality (Stats SA, 2012b)

4.3 Economy

The environmental analysis revealed that the Mossel Bay Municipality is located on the Southern Cape coastline of South Africa and this coastline influences much of the economic activity of the municipality. The population of the municipality has historically grown along the coast where people have settled in coastal towns which means most of the economic activity of the municipality is located along the coast.

4.3.1 Economic Growth

The economic growth rate of the Mossel Bay Municipality progressively increased between 2002 and 2009, with high rates of growth between 2002 and 2007. There was a contraction in the economy in 2009 due to the global economic downturn. The economic growth rate of Mossel Bay Municipality has also been greater than the economic growth rate of the Eden District Municipality with the municipality outperforming the district in every year during this period as figure 29 indicates (WCPT, 2011).

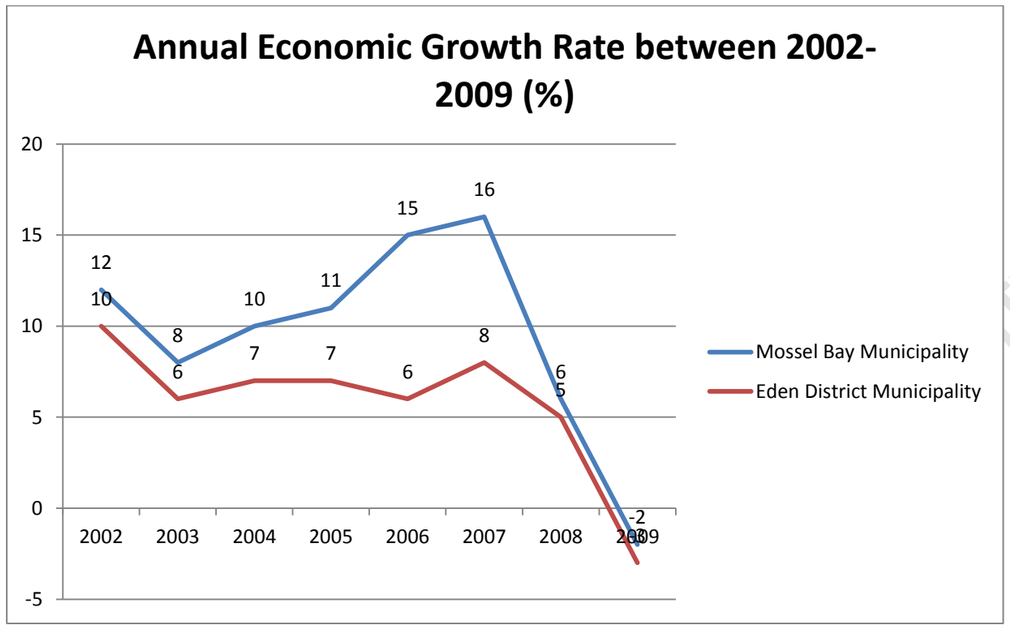

Figure 29: Annual Economic Growth Rate Comparison. (WCPT, 2011)

Despite the recession in 2008, Mossel Bay's economy grew at an average annual rate of 9.2 % over the period of 2001 to 2009 compared to the district's average annual growth rate of 5.8 %. This relatively good annual economic growth rate between 2002 and 2009 has resulted in the municipality having the second biggest economy in the Eden District behind George Local Municipality. In 2010, it contributed 25.4% of the Gross Domestic Product of the district compared to 32.0% of George Municipality. The Eden District municipality economy has been the fastest growing region in the Western Cape, expanding at an average annual rate of 5.1 per cent between 2000 and 2010. During the same period the Mossel Bay Municipality has contributed 35.8% of the economic growth of the Eden District Municipality which is the strongest contribution to the cumulative growth in the district therefore it could be argued that Mossel Bay Municipality has been playing an integral role in the growing of the economy of the district.

4.3.2 Sectoral Growth and Contributions

The performance of the economy of the municipality between 2000 and 2010 can be sectorally divided which is what the table below shows.

Sector	GDPR (%) Share	Employment	GDPR Yoy (%)
Agriculture, Fisheries, Forestry	3.5	-1947	4.8
Mining and Quarrying	0.1	-280	-14.8
Manufacturing	26.9	-351	5.9
Electricity, Gas and Water	2.1	115	9.3
Construction	8.9	2791	15.3
Wholesale and Retail, Catering and Accommodation	15.2	3481	8.3
Transport, Storage and Communication	5	7	3.8
Finance, Insurance and Business Services	24.1	2528	8.7
Community, Social and Personal Services	4.9	2295	8.6
General Government	9.3	2948	7.6
Total	100	11596	7.5

Table 3: Sectoral Growth and Contribution to GDP. (WCPT, 2011)

Table 3 highlights the growth and contribution of the economy sectorally. According to the table the biggest contributors of the GDPR of the Mossel Bay Municipality between 2000 and 2010 is the manufacturing, financial and business services and wholesale and retail, catering and accommodation sectors which shows that the secondary and tertiary sectors is the best performing economic sectors in the municipality (WCPT, 2011). It is important the secondary and tertiary economic sectors are rigorously supported to ensure that the economy of the municipality continues to experience positive growth in the future as any decreases in these sectors will lead to a great loss of jobs which the municipality can ill afford considering the relatively high unemployment rate of the municipality. According to the Town Planner, the tourism and manufacturing industries has the potential to employ people with modest skills in the municipality. Consequently these sectors need to be stimulated to create the jobs for the unemployment population of the municipality (WCPT, 2012). The agricultural, fishing and forestry sector has experienced one of the smallest economic growth rates in the municipality over the past ten years and is reflected by the biggest decrease in employment by sector in the municipality which means the primary sector of the municipality is not performing well and this further exacerbates the unemployment problem as historically many people have been employed in the primary sector. New opportunities in the agricultural, fishing and forestry sector need to be explored such as aquaculture and organic sheep farming as the municipality has the resources for these opportunities to be explored (WCPT, 2012). With 90% of all economic sectors growing in the municipality over the past decade, the good performance of the economy of the municipality during this period comes as no surprise. Despite the good performance of the economy, the employment statistics of the municipality reveal that a large proportion of young people (between 18 and 35) in the municipality remain unemployment therefore absorption of young people into the economy remains one of the main economic challenges moving forward.

4.3.3 Local Economic Development

The Mossel Bay Municipality adopted a Local Economic Development (LED) strategy in 2008 like many other municipalities around the South Africa. National government identified LED as a strategy to decrease poverty and unemployment amongst the local communities by creating sustainable employment opportunities. (Nel et al, 2009) According to the Mossel Bay Municipality 2010 Annual Report the municipality identified four Local Economic Development anchor projects, namely a waste management project for Mossel Bay and rural areas, a fish farm project for Great Brak River, a bee-farming and honey bottling project for Herbertsdale and a wax sheet production project in Mossel Bay (MBM, 2011). The success of these projects has not been documented however these are the type of projects that could yield sufficient results if these businesses are properly mentored and supported by existing successful business people in the municipality. In 2011, LED projects in the Mossel Bay Municipality took place mainly in the form of the innovative entrepreneur's project in terms of which 40 entrepreneurs were identified and assisted in forming their own work teams to clean up allocated geographical areas across the municipal district as well as participation in the Extended Public Works Programmes (EPWP). The entrepreneurs contributed to the generally neat appearance of beaches as well as the Central Business District and most residential areas. An amount of R5, 8 million was spent in this regard and 267 jobs were created. A total of 502 temporary jobs were created through EPWP projects (MBM, 2012b). Conservation and 'green' type of projects can be expanded in the future as the municipality adapts to the effects of climate change. The municipality needs to become much more sustainable as currently it is heavily reliant on non-renewable energy and innovative uses of waste through waste collection and recycling programmes can lead to increased resilience. The municipality is home to precious environmental resources such as Fynbos and marine ecosystems which creates an opportunity for local people to monitor these resources in order to ensure they remain in good condition and not degraded to the point of extinction.

4.3.4 Informal Economy

The 2012-2017 Mossel Bay Municipal IDP, 2011 Regional Development Profile of the Eden District Municipality and the 2012 Municipal Economic Review and Outlook of the Eden District Municipality make scant mention of the informal economy of the Mossel Bay Municipality. This neglect of the informal economy in the municipality means that a vital component of the economy is not known as the informal economy can play a significant role in reducing unemployment and poverty levels in the municipality. The informal sector provides between 50% - 75% of employment in Sub-Saharan Africa and 78% if South Africa is excluded (Sparks & Barnett, 2010) which shows that there is potential for the informal economy to create jobs for the unemployed persons in the municipality. This is a huge gap that needs to be understood for the long-term economic future of the municipality.

4.3.5 Potential of Towns

In 2004, Mossel Bay was the only the town in the Mossel Bay Municipality regarded with high development potential according to a study on the development potential of towns in the Western Cape undertaken by a university research team on behalf of the Provincial Government (DEADP, 2004). The study drew on both quantitative and qualitative analysis to rank the potential of towns in the province. According to the study, the reasons for the high development potential in Mossel Bay were because the

town recorded high levels in the following indexes Human Resources, Transportation/Communication, Institutional and Commercial Services, as well as Market Potential to some extent. Therefore the employee base, proximity to important transport infrastructure such as the N2, George Airport and Mossel Bay Harbour and an diverse economy such as manufacturing, tourism, petrochemical allowed Mossel Bay to have a favourable rating (DEADP, 2004). This assessment was accurate as the years following the study the annual economic growth rate in the municipality experienced double digit growth before the recession struck in 2008 which put halted the development of the municipality. A revision of the 2004 study was done in 2010 based on the same criteria and it shows that Mossel Bay continues to be the only town in the municipality with a high development potential for the future (DEADP, 2010). Other towns in the municipality such as Kleinbrak Rivier, Grootbrak Rivier and Friemersheim all have low to medium development potential. The challenges that could prevent Mossel Bay achieving its high development potential include a decrease in the skill levels population and an increase in the social needs of the population (DEADP, 2010).

4.3.6 Spatial Economy

The economy map on figure 30 of the Mossel Bay Municipality reveals that the town of Mossel Bay has the most diverse economy of all towns in the municipality. The reason for Mossel Bay having the most diverse economy is due to the town containing numerous sectors of the economy of the municipality which means it is a mixed economic area consisting of tourism, industrial, commercial and other economic sectors. Just outside the town of Mossel Bay there is the industrial park which houses PetroSA, the Gourika Power Station and other industrial related businesses. The coastal urban towns of Dana Bay, Hartenbos and Grootbrak Rivier mainly have tourism as their main economic activity with businesses in these towns providing services such as accommodation, food and selling of arts and crafts in these towns which are mainly for local and international visitors during the peak tourism months. The inland rural towns of Brandwag, Hertbertsdale and Friemersheim have agriculture as their main economic activity with the growing of dry land crops and sheep farming being the main agricultural activity taking place. With Mossel Bay having the biggest economy and the largest population in the municipality it is of little surprise that most economic growth and investment is taking place in the town. This growth and investment needs to be continuously supported as most of the municipalities economic growth is likely to be concentrated in the town of Mossel Bay while other towns need to expand their existing economic activities to create jobs for the people whom reside in those towns.

Figure 30: Economy Map of the Mossel Bay Municipality (Stats SA, 2012)

4.4 Settlement and Infrastructure

4.4.1 Hierarchy of Towns

The Mossel Bay Municipality is made up of a hierarchy of towns with each town having a specific role and focus in the municipality (see figure 31). Mossel Bay, the town is considered the highest order settlement in the municipality as it has the biggest population, economy and plays the administrative role in the functioning of the municipality making it the capital of the municipality. Hartenbos, Grootbrak Rivier and Dana Baai are in the second order of settlements in the municipality with these towns having similar population and area sizes. Towns in the second order of settlement have their main economic function derived from services-based activity from tourism as these towns are located at the coast which has the beaches which visitors frequent during the year. While the towns of Freimershiem, Brandwacht and Herbertsdale are in the third order of settlement in the municipality with these towns having similar population and area sizes. Towns in the third order of settlement have their main economic function derived from agricultural activity from sheep farming and dry land crop production these towns are located in the central rural areas of the municipality where arable land and land with grazing potential is found. Using 15 kilometre distance rings around all the settlements in the municipality it shows that a large percentage of the total area of the municipality is located within a 15 kilometre from a settlement (see figure 31). This reveals that a large percentage of people in the municipality are within range of accessing public services and facilities located in the settlements closest to them. However the quality of the public services and facilities within all settlements is limited as the social welfare analysis revealed.

Figure 31: Settlement System of the Mossel Bay Municipality (Stats SA, 2012)

4.4.2 Transport Infrastructure

Transport infrastructure is fundamentally important for movement of people, goods and services as it connects different components of the region and in the Mossel Bay Municipality the main forms of transport is by road and sea. There is a total of 902.7 km of road network in municipality with the transport infrastructure map on figure 33 showing where the different classes of road infrastructure is located in the municipality (MBM, 2011b). With only 254 km of the road network surfaced it represents only 28.1% of the total road network and most of these surfaced roads are located in the urban areas of municipality where majority of the economic activity take places and where majority of the population resides. The 71.9% of the total road network remains gravel and majority of these roads are found in the rural areas of the municipality (MBM, 2011b).

There is only one harbour in the Municipality which is operated by the National Ports Authority of South Africa (NPA) but it is not one of the main ports used by the ports authority in the country which means it operates on a much smaller scale (see figure 32). The harbour has two offshore mooring buoys which handled a total tonnage of 2 million tonnes during the 2008/9 financial year, With 1, 2 million tonnes of cargo shipped to other ports in the country and 800 000 tonnes landing at the port (Transnet, 2012). There are plans by the NPA to expand the harbour to allow bigger operations to take place at the harbour to increase support to the larger ports in the country once its current Capital Investment Plan is complete which runs between the years 2012 and 2016 (Transnet, 2012). There is a limited public transport system in the municipality with the low population densities of the municipality not economically viable for an extensive transport system. As a result of the limited public transport system 71% of residents travel by private car and 29% of residents utilise the minibus taxi service (MBM, 2011). Most users of the minibus taxi are in the lower-income categories in the poorer communities in the municipality with no alternative transport options available, they are depended on minibus taxis for travel which continuously increase their fares with increases in petrol cost (at the time of writing 1litre of unleaded petrol cost R13) which results in the poorest residents of the municipality bearing the brunt of expensive fuel prices. A means of becoming resilient to increasing fuel costs has seen the rise of non-motorised transport (NMT) routes linking the different communities to the most frequently used areas of the municipality such as the Central Business District, Langeberg Mall and newly constructed lanes to the rural areas to ensure access to rural towns. NMT infrastructure will become increasingly important for the movement of people as non-renewable oil resources start to decline and prices escalate to unaffordable levels as a result (De Langen, 1999).

Figure 32: Transport Infrastructure Map of the Mossel Bay Municipality (Stats SA, 2012)

4.4.3 Basic Service Infrastructure

As a municipality, Mossel Bay Municipality is responsible for the provision of basic services such as water, sanitation and electricity as directed by national government. In order for residents and businesses to have access to water and electricity, the municipality needs to provide the infrastructure to deliver these basic yet critical services while maintaining this infrastructure to ensure that the municipality functions optimally at all times (MBM, 2012a). The 2011 Census revealed that more than 90% of households in the municipality have access to water, sanitation while more than 70% of household utilise electricity for lighting (Stats SA, 2012c). Therefore an increasing amount of people in the municipality had access to basic services over the past decade. This is due to increasing amounts of money being spent in delivering basic services for residents while ensuring that businesses have access to these essential services. 98% of the capital budget was spent in 2011 with majority of the budget geared towards service delivery (MBM, 2012a). Despite this high overall level of basic service provision, there remains discrepancies between the levels of basic service received in the urban areas compared to the rural areas. Urban areas have greater levels of basic service provision in terms of access to water, electivity, solid waste removal and road infrastructure which is reflected by the size and economic performance of the urban settlement

4.5 Institutional Arrangements

4.5.1 National Government

The South African National Government plays a foremost role in ensuring economic and social development in the municipality while also ensuring that the natural environment is protected through legislation, policy and programmes. In terms of social development the national government provides the social grants such as child care grants, old age pensions and people with disability in the municipality while the national unemployment fund provides economic relief to those without employment for a limited period of time. Other notable national departments playing a role in the functioning of Mossel Bay Municipality include the Department of Tourism as Mossel Bay Municipality is one of the leading tourist destinations in South Africa attracting both local and international visitors. The Department of Environmental Affairs plays a role in the ensuring the natural environment is protected as the municipality falls within a region of huge environmental significance with its terrestrial, aquatic and marine ecosystems. The Department of Water Affairs as a department either operates and maintain water resource infrastructure in the municipality such as dams or protect the river and wetland systems found in the municipality. The Department of Trade and Industry ensures that the municipality attracts local and foreign investment to stimulate economic growth for the municipality and country. The South African Police Services provides the security services to ensure that communities in the municipality are safe from crime while also serving to prevent crime taking place in the municipality.

4.5.2 Provincial Government

The Western Cape Provincial Government is principally responsible for the provision of primary and secondary education, primary healthcare and cultural activities. It ensures that public facilities and services are provided through its Department of Education, Department of Health while the Department of Sport and Cultural Affairs ensures that sports and recreational facilities and services are provided in the municipality. Furthermore Western Cape Government-backed economic agencies such as Wesgro (the provincial investment and marketing agency) and Red Door provide to support small business as to ensure economic development in the municipality. The Western Cape Provincial Government institutions are critically important for the future of the region as they provide support to the region in the form of provision of schools, clinics, libraries and support for the establishment of small and micro business enterprises.

4.5.3 Local and District Municipality

The Mossel Bay Municipality and Eden District Municipality plays a leading role in ensuring infrastructural services in the municipality in terms of basic service provision. They are responsible for the provision of water, electricity, sewage and road infrastructure and the maintenance of this infrastructure. Other functions include solid waste removal and local economic development. They obtain funding from both national and provincial programmes to ensure that these services are provided to the people of Mossel Bay. Therefore they will be responsible for any new built infrastructure and maintaining of infrastructure which is required such as the establishment of new roads and services for new buildings. Furthermore they are responsible for all planning activity such as zoning schemes and building regulations taking in the municipality however still require provincial and national approval for certain activities. Table 4 below shows the Capital Budget of Mossel Bay Municipality for the next three financial years. It details the sources of funders for capital projects and the amount of money received from different funders over the next three years. This table illustrates how many different funding sources contribute to the capital budget of the municipality. It also shows that funding does not necessarily increase on an annual basis but fluctuates based on the amount of money received annually while it highlighting the limited nature of the budget under which the municipality operates under.

Funding Source	2012/13	2013/14	2014/15
Capital Replacement Reserve	R 69 626 170	R 69 887 050	R 70 857 300
Municipal Infrastructure Grant	R 17 156 000	R 18 098 000	R 19 144 000
Extended Public Works Programme	R 2 461 000	0	0
Recoverable Developers	R 2 050 000	R 2 400 000	R 2 500 000
Department of Energy	R 1 000 000	R 1 000 000	R 7 500 000
External Loans	R 699 000	R 175 000	R 485 000
Department of Human Settlements	R 22 465 400	R 12 000 000	R 12 000 000
Municipal Systems Improvement Grant	R 22 600	R 0	R 0
Community Development Works	R 20 000	R 15 000	R 15 000
Library Subsidy	R 6 000 000	0	0
Total	R 121 500 170	R 103 575 050	R 112 501 300

Table 4: Capital Budget of the Mossel Bay Municipality (Mossel Bay Municipality IDP, 2012)

4.5.4 Non-Governmental Organisations

The four above mentioned institutions plus various non-governmental organisations (NGOs) play a leading role in the protection, conservation and preservation of the natural environment. Departmental agencies from national government such as SANBI are responsible for the protection of biodiversity in the country while the provincial governments Department of Environmental Affairs and Development Planning and Cape Nature is responsible for environmental planning in the province. NGO's such as C.A.P.E is responsible for conserving the Cape Floristic Region which the municipality falls under Other NGOs in the municipality are concerned with social welfare in the municipality and work towards to reducing poverty in the municipality through job creation and skills development, improving healthcare and education to improve the standard of living in the municipality and operate feeding schemes to ensure people do not have to go to bed hungry. There are several local associations and groups in the municipality which include but not limited to farmer associations, local tourism associations and workers unions.

4.5.5 Departmental Budgets

All these institutions are assigned an annual budget which ensures that their operational mandates are met. Some institutions have significantly large budgets while others have notably small budgets. However the size of an institutions budget does not determine how well an institution performs instead it is how well a budget is spent because it is proven that institutions that use their budgets diligently tend to be more successful in their mandates. In some cases there is a severe under spending of their annual budgets which directly impact the people and resources in the municipality. For example the under spending of an environmental budget could result in critical biodiversity species being degraded to the point of irreversible damage therefore the under spending of budgets has huge implications for the future of the municipality. This highlights the important nature of the budgets in the functioning and performance of the region. The numerous different line departments from all the spheres of government highlights the institutional thickness of the municipality and this thickness increases the complexity of providing public services and facilities such as housing for example as it goes through numerous channels before the trenches of a house is actually dug. The many different line functions require an intricate co-ordination of roles and responsibilities. Using public-private partnerships and intergovernmental partnerships can ensure a more streamlined process in the delivery of services and facilities required for the Mossel Bay Municipality to be a place where everyone can fulfil their potential irrespective of race, age, gender and socio-economic status.

3.6 Human Settlement Synthesis

The Human Settlement Synthesis Map on figure 33 highlights the human settlement opportunities and constraints that exist in the Mossel Bay Municipality. The location of the different economic sectors of the municipality shows that specific areas are suited for specific economic activity for example the coastal towns are best suited for tourism and the inland towns are best suited to agricultural activity. Coastal urban towns of the municipality have a much higher level of service provision in the municipality which means that the coastal towns are much better placed for future economic growth and investment in the municipality. Since the cost of servicing or upgrading infrastructure in these towns will be significantly less than servicing the rural towns in the central areas of the municipality which do not have the same level of provision. This is particularly important considering the limited budget the municipality has to work with; it needs to spend its capital wisely in order to gain the biggest economic returns. The coastal towns are also much better located in terms of transport infrastructure as the national N2 highway connects the southern and eastern parts of the municipality to the countries major cities such as Cape Town, Port Elizabeth and Durban. This is particularly important as the municipality becomes more competitive in the global economy. As those cities have ports and airports which connects the Mossel Bay Municipality to the rest of the world. There remains the possibility of expanding the Mossel Bay harbour to augment the services of other port cities which will lead to greater efficiency of the municipality. With their being a greater concentration of public facilities and services in the coastal urban towns of the municipality it is clear that this leads to inequality between the urban and rural populations of the municipality. People in rural towns do not enjoy the same of public services this needs to be rectified as inequality needs to be reduced in the municipality. This requires a greater level of public service provision in towns that currently do not have quality services and facilities. In terms of the economy, Mossel Bay is the town with the most potential for economic growth which means other towns in the municipality will not create the necessary job opportunities that is required for the growing population of the municipality. However, with Mossel Bay creating many job opportunities in the future it will lead to an expansion of the town itself which will mean that land in and around Mossel Bay will need to be developed to house the future population. It is important that urban development leads to much more compact municipality and do not follow the previous inequitable spatial patterns. This can be done through infill development and increasing densities population in the town which will open opportunities for all people in the municipality.

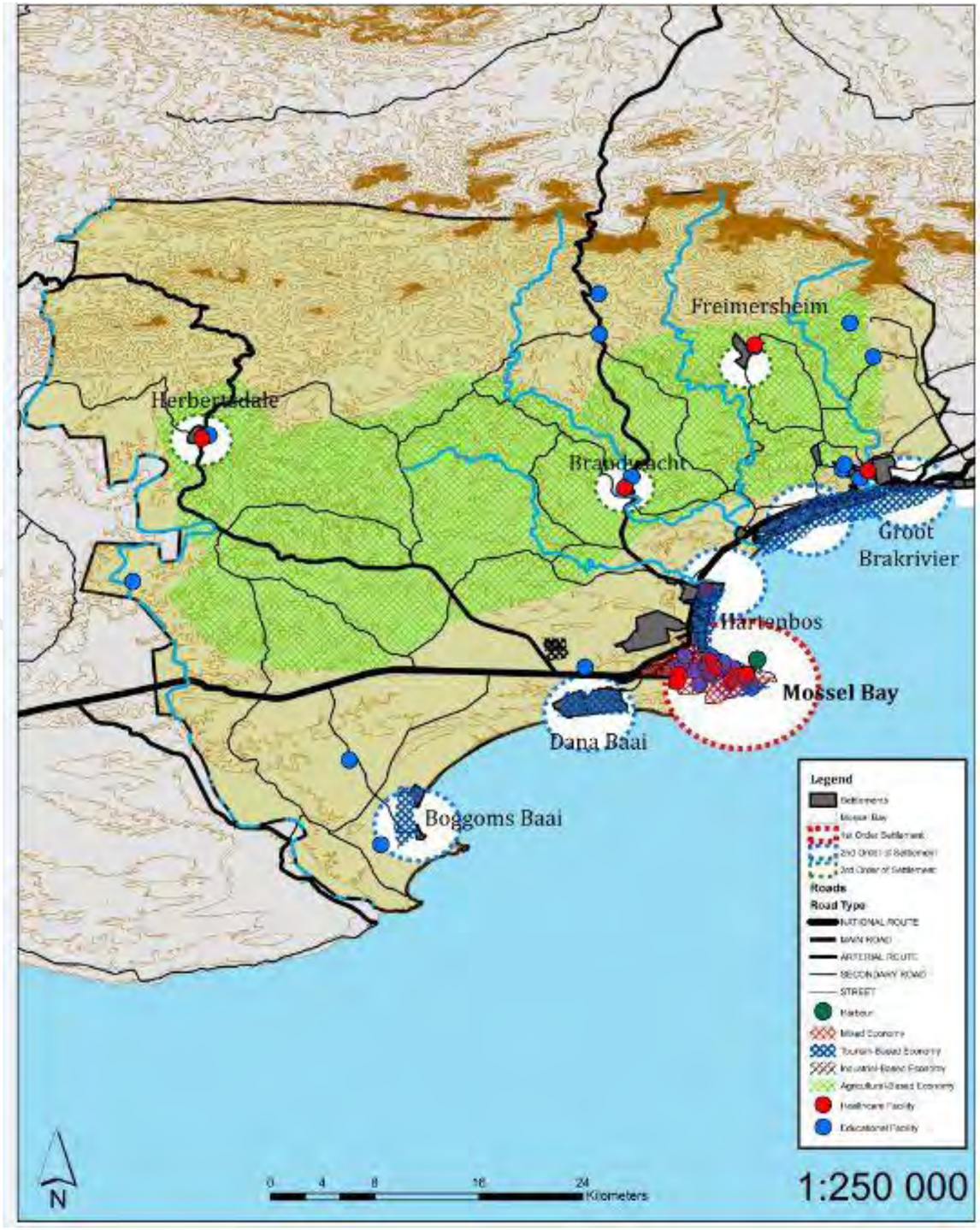

Figure 33: Human Settlement Synthesis Map of Mossel Bay Municipality

5. Analytical Synthesis of Mossel Bay Municipality

The analytical synthesis of the Mossel Bay Municipality identifies which environmental and human settlement features serve as limiting factors in the optimal functioning of the municipality and which environmental and human settlement features serve as catalysts for the improvement in the functioning of the municipality. Therefore this section is a spatial representation of the opportunities and constraints that exist in the region.

5.1 Spatial Opportunities of the Mossel Bay Municipality

According to the spatial opportunities map of the municipality on figure 34, large tracts of land in the central rural areas of the municipality is considered arable for the growing of agricultural crops and have grazing potential for sheep and livestock farming activity which means there is opportunity to increase agricultural production in the municipality if it done through sustainable farming techniques. Figure 35 shows that the beautiful coastline and mountainous terrain of the municipality has the potential to attract an increasing amount of visitors to the municipality. By improving tourist related infrastructure in these areas will allow a greater number of visitors to the municipality as the municipality has the ideal climatic conditions, scenic views and beaches for tourists seeking beach or adventure holidays. There is significant opportunity to utilize renewable energy sources such as wind and solar energy in central area of the municipality. This can lead to the decrease on the reliance on non-renewable resources for energy which will improve the sustainability for the municipality and make it resilient to the high costs of electricity while ensuring a reliable long term electricity supply for the municipality There is a high level of basic service provision with regards to water and electricity; and well maintained road infrastructure in Mossel Bay which means Mossel Bay the town is best suited for economic growth as it has the level of infrastructure required for economic growth. The existing national road infrastructure currently connects Mossel Bay Municipality to the major cities in the country such as Cape Town, Port Elizabeth which have huge shipping ports while the N2 also connects to the town of George which has a regional airport. This transport connection allows the municipality to be in advantageous position of sufficiently moving goods, services and people. The harbour in Mossel Bay has the potential to expand according to the National Ports Authority. The proposed expansion will see the municipality play a bigger role in the shipping industry of the country. The harbour can facilitate direct movement of goods from Mossel Bay which will decrease operational costs of the primary and secondary sectors. The expansion of the Harbour in Mossel Bay can lead to an increase in investment in the manufacturing and related industries which will stimulate job creation through the forward and backward linkage industries.

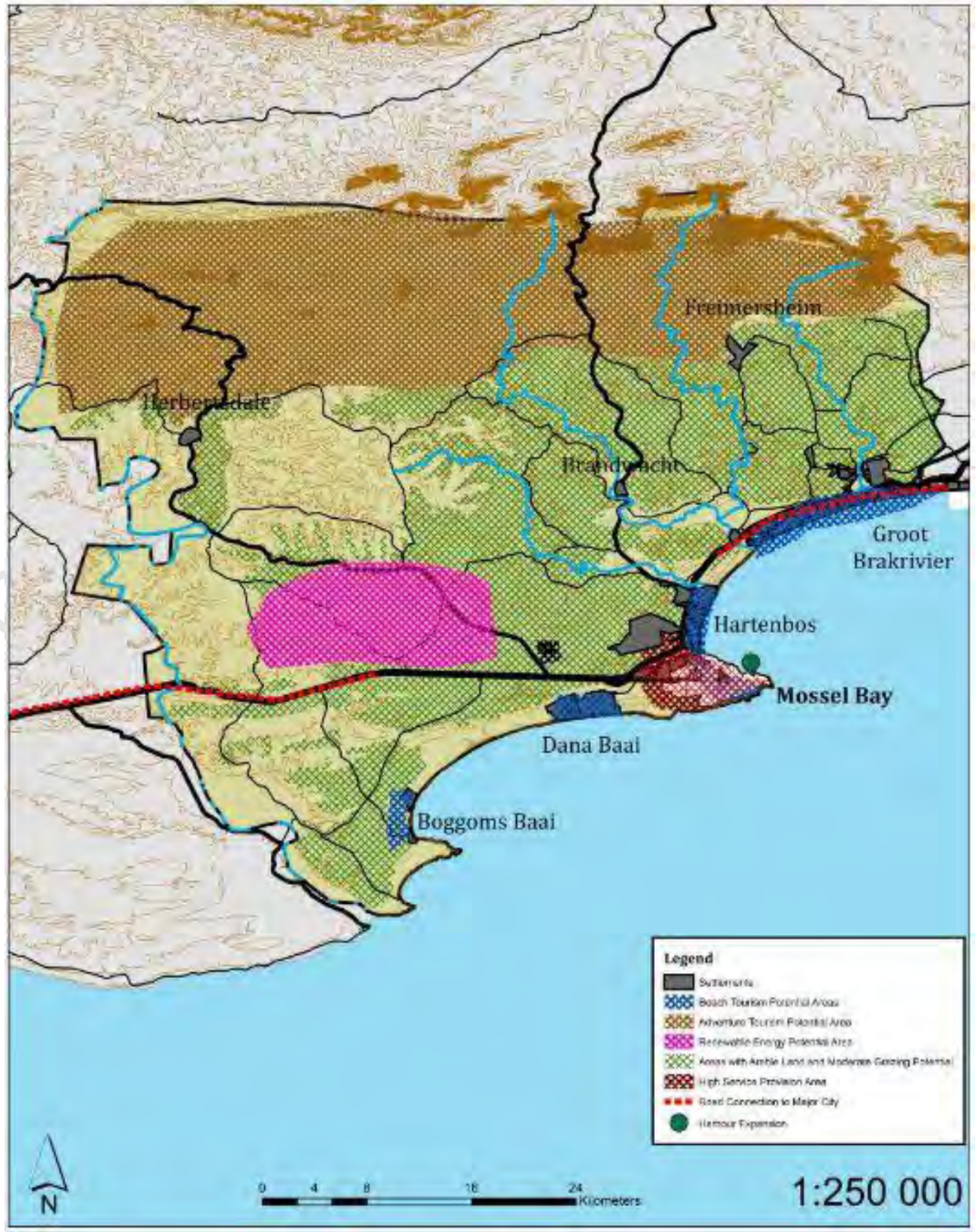

Figure 34: Spatial Opportunities Map of the Mossel Bay Municipality

5.2 Spatial Constraints of the Mossel Bay Municipality

Due to the vast amounts of valuable natural vegetation in the municipality, it limits urban expansion and development in areas that are part of the critical biodiversity network. While the steep, mountainous terrain in the northern areas of the municipality limits possible urban development as it is not economically feasible to develop land on a steep gradient due to the high costs involved in packaging and servicing land. Therefore the critical biodiversity areas and mountainous terrain as figure 35 indicates serves as constraints as any possible development in these areas will alter the valuable natural ecosystems and change the landscape character of the municipality. As both the biotic ecosystems and mountainous terrain are key physical features that contributes to the uniqueness of the Mossel Bay Municipality which needs to be maintained to keep the municipality's sense of place. With the Mossel Bay having an important part of the Garden Route coastline in its boundaries, it serves as a constraint to urban development expansion as areas within 50m of the shoreline forms part of the coastal zone which is put in place to protect the coast from further environmental degradation to ensure the long-term sustainability of the coast which is under tremendous pressure from development (see figure 35). While areas within 50m of rivers are also unsuitable to development as the degradation of riparian areas from urban expansion leads to irreversible damage to aquatic ecosystems which the municipality can ill afford considering the important role rivers play in the mitigation of the effects of climate change. The western areas of the Mossel Bay Municipality does not have an abundance of fertile soils which means that there is plenty of non-arable land and land with low grazing potential which has been caused from unsustainable and inappropriate farming techniques, therefore agricultural expansion for commercial purposes in the western areas is not possible (see figure 35). The fact that there is a high concentration of public facilities and services in the eastern urban areas and a poor public transport system in the municipality makes people residing in the northern and central rural areas and settlements on the edges of towns having limited access to these public services and facilities. The inadequate investment of infrastructure in the rural areas of the municipality means that rural towns are not as developed as the urban areas and this is seen in the poor road infrastructure in the rural areas of the municipality with half of the roads not being tarred The inadequate infrastructure of the rural areas results in greater economic investment in the eastern urban areas as businesses want to operate in places with quality infrastructural elements such as tarred roads, electricity ,water and telecommunications in order to operate effectively which is what the town of Mossel Bay offers.

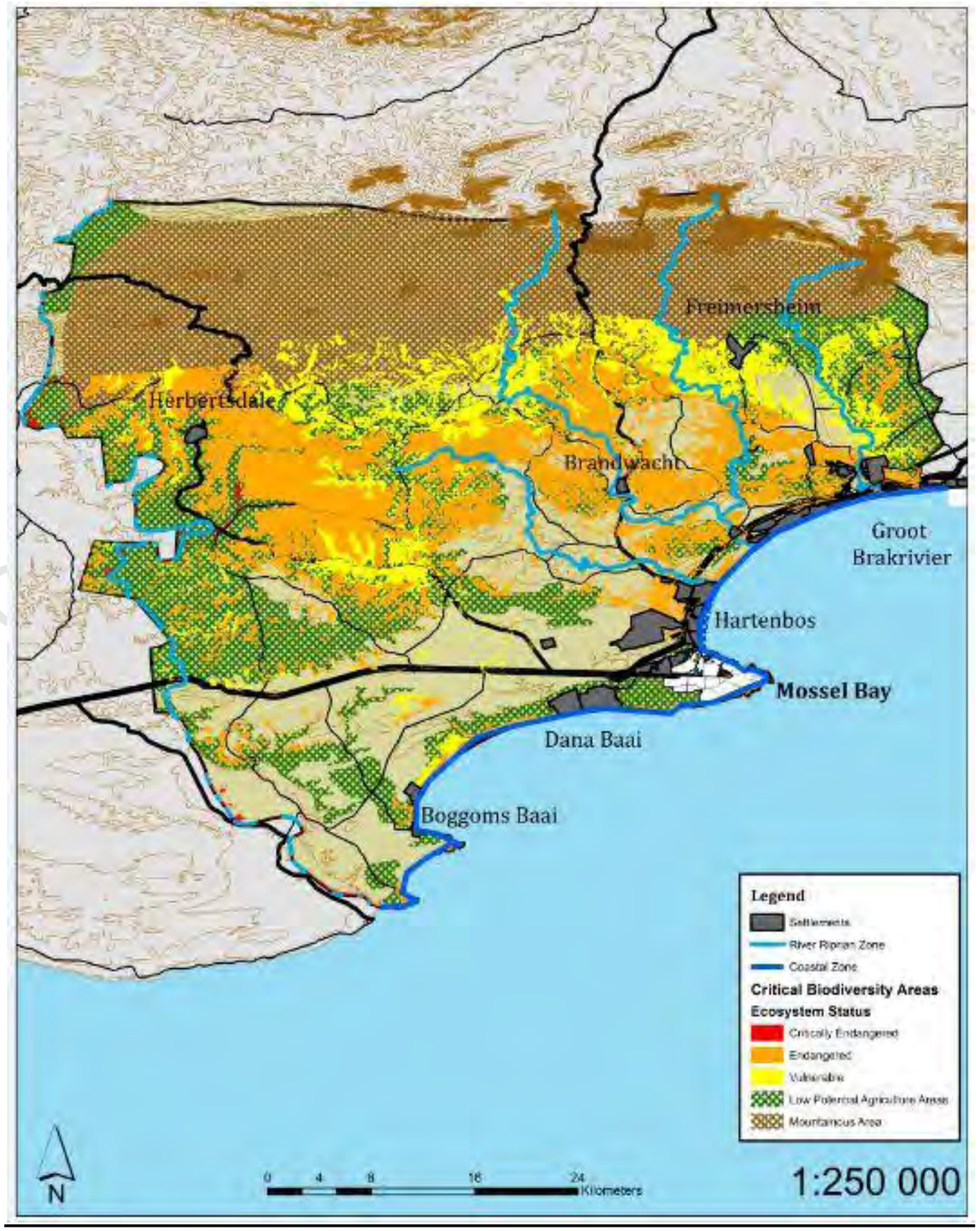

Figure 35: Spatial Constraints Map of the Mossel Bay Municipality

5.3 Key Development Issues

Key development issues are the main problems that need to be solved which will have the biggest positive impact on the way the municipality operates. Drawing from analysis section, four key development issues were identified which can enhance the functioning and performance of the municipality. In order for the municipality to effectively adapt to climate change and ensure human development, it needs to respond to the trends it faces currently with the view of ensuring that the municipality is functioning optimally by 2040. The four key development issues are namely the provision of quality social facilities, conservation and preservation of natural resources, diversification and growth of the economy and improving the sustainability of the municipality.

5.3.1 Provision of Quality Social Facilities

The human settlement analysis revealed that there is a high ratio between the number of people to social facilities such as educational and healthcare facilities in the municipality. The analysis revealed that the municipality has inadequate social facilities with scenarios like one school for every 1 000 people under the age of 19 in the municipality and 1 healthcare facility for every 5 962 people in the municipality. With the population of the municipality predicted to continue to grow over the next 27 years as a result of immigration and birth rates exceeding emigration and death rates. This will mean that this already high ratio of public facilities to people will become even larger. The growing population means that even more pressure is placed on existing services and facilities which results in further the dilution of quality in services and facilities. This problem will only exacerbate further if the current levels of service provision is maintained, therefore, a substantial effort is needed to radically improve the quality and access of social facilities in the municipality which can be done through the provision of new and upgraded schools and clinics.

5.3.2 Growth of the Economy and Creation of Employment

The human settlement analysis indicated that the economy of the municipality has dramatically declined since 2008 as a result of the world economic recession. With the economy experiencing negative growth since 2008, little employment opportunities have been created. This among other factors has led to a high unemployment rate amongst the youth of the municipality with 70% of the unemployed people in the municipality being under the age of 35. Therefore there is a critical need to grow the economy of the municipality in order to create the job opportunities the municipality desperate requires. The analysis also showed that the municipality has a diverse economy with 10 different sectors contributing to the Gross Domestic Product of the municipality. With the secondary and tertiary economic sectors being the best performing sectors of the economy of the municipality, these sectors need to be vigorously supported in order to create sustainable employment opportunities for the citizens of the municipality. While the diversification of the economy is also necessary to create new employment generating industries, this can be done through exploring the opportunities that the informal economy presents and supporting the declining primary sector of the municipality through innovative and sustainable projects.

5.3.3 Conservation and Preservation of Biotic Systems

The environmental analysis revealed that the Mossel Bay Municipality forms part of the Cape Floristic Kingdom which is an incredibly significant biodiversity area. The biotic system of the municipality comprises of important rivers, estuaries and vegetation with each component of the biotic system highly dependent on each other for the optimal functioning of the region. The conservation and preservation of the biotic systems will ensure the long-term future of the municipality as the municipality is severely dependent on all the natural resources for the survival of its residents. Biotic systems provide the ecosystems services such as fresh water, cleaner air and protection from natural hazards. Thus, the conservation and preservation of natural resources of the municipality will ensure that the effects of climate change on the municipality are mitigated as it creates an environmentally resilient region.

5.3.4 Increasing the Sustainability and Resilience of the Municipality

The environmental analysis also showed that there is a heavy reliance on non-renewable resources such as natural gas, oil and coal in the generation of electricity and for transport purposes in the municipality. The increasing demand for electricity and fuel from a growing population and use of non-renewable resources for electricity and transport does not bode well for the future of the municipality as it moves further into the 21st century. The dependence on finite resources is unsustainable as it cannot provide electricity and fuel forever. If the municipality does not increase its sustainability and resilience in terms of its material flows, the municipality will be left to face dire consequences from its inability to provide public services. Thorough generating electricity from a renewable energy means and constructing non-motorized transport infrastructure, the municipality can become self-sustaining which will ensure the long-term well-being of the people in the municipality as the electricity supply in the municipality will be guaranteed well into the future as well the ability of people to travel within the municipality.

6. Approach to Regional Planning

This section describes which approach to regional planning this RSDF takes to guide future development in the municipality. The regional planning strategy selected takes cognizance of a number of factors such as the key development issues of the municipality, the different approaches of regional planning and the policy context in which the Mossel Bay Municipality operates under. Therefore, this section describes each legislative context which the RSDF operates under and how it is aligned to each policy informant. The chapter then concludes by stating the rational for adopting unbalanced approach to regional development in Mossel Bay Municipality.

6.1 Policy Informants

Due to the three tier system of government in South Africa there is national, provincial and district planning directives that inform local and regional planning. The policy informants that apply to Mossel Bay Municipality include the National Spatial Development Perspective, Western Cape Provincial SDF and Eden District and Mossel Bay Municipality IDPs. The National Spatial Development Perspective (NSDP) of South Africa provides a framework for a far more focused intervention by the State in equitable and sustainable development with a purpose of fundamentally reconfiguring apartheid spatial relations and to implement spatial priorities that meet the constitutional imperative of providing basic services to all and alleviating poverty and inequality. It represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty (The Presidency, 2007). As these are the biggest challenges facing South Africa 20 years post-Apartheid and certainly are apparent in the Mossel Bay Municipality

IDP's and SDF's in the country must be aligned with the NSDP in order to effectively solve the problems facing the country. The NSDP argues that there is need to focus on areas of growth and potential, and outside of these areas, government should provide only basic services and concentrate on social investment (human resource development, social transfers, labour market intelligence) to enable people to move to areas of greater economic potential. Thus, it favours an unbalanced approach to development in regions according to the economic potential of a region. This is because different regions in South Africa have different economic potential and the spatial variations in the incidence of poverty are also vastly different. Economic growth and development is likely to continue in major centers of the past, and these need to be supported, but there may be localities where potentials are underexploited that also deserve support. This spatial targeting approach to regional development is due to the failing of previous regional plans and policies where unfocused infrastructure spending (investment in areas with low economic potential) and unfocused human resource development (investment in areas with low social capital) lead to minimal economic growth and employment creation therefore the NSDP argues for a unbalanced approach to regional development (The Presidency, 2007).

The NSDP states that the diverse and disparate spatial contexts in the country suggest a policy approach that itself should be differentiated and conducive to the requirements of the different contexts. Hence, in areas of low or no economic potential, the path of development and poverty reduction should be through a focus on investment in human capital development (education, training, social welfare, sound rural development planning, aggressive land and agrarian reform). While in areas with high to medium potential the path to development should focus on infrastructural investment and development interventions to improve the international competitiveness of the region which will ensure maximum and sustainable impact (The Presidency, 2007). This RSDF of Mossel Bay Municipality is in agreement with the NSDP that areas with high development potential should be vigorously supported in order to improve the economic efficiency of those areas while areas with low development potential should have their basic needs taken care of. It is highlighted by the potential of towns that one specific town (Mossel Bay) in the municipality has a higher level of development potential than all other towns in the municipality.

The Western Cape Provincial Spatial Development Framework (PSDF) is a framework to guide (metropolitan, district and local) municipal IDP's and SDF's in the Western Cape Province. The concept diagram of the PSDF can be seen in figure 36. The concept diagram in figure 36 shows that there are prioritised areas for economic intervention in the province with the Southern Cape region which the Mossel Bay Municipality falls under being one of those areas targeted for economic investment and growth. Therefore it is up to the municipality to create an environment that attracts investment to the Mossel Bay region as the provincial government's strategies and policies support the idea of economic growth and investment in the municipality which means provincial support can be expected for the economic strategies envisaged in this RSDF.

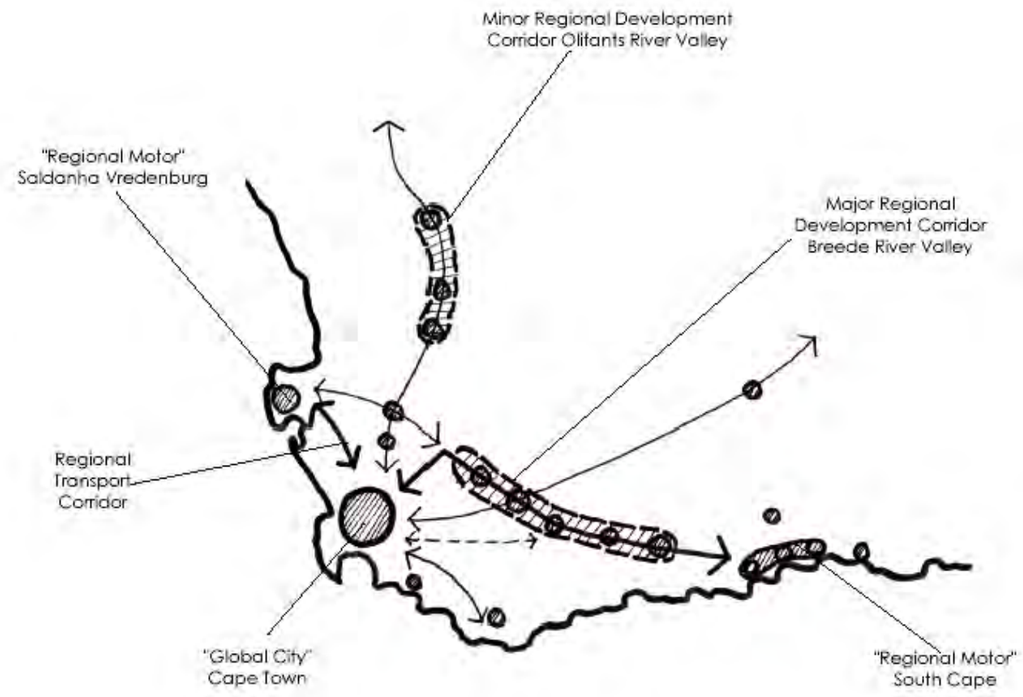

Figure 36: Prioritised Areas of Economic Intervention (PGWC, 2009)

The PSDF is in agreement with the NSDP that development needs to be prioritised in the province to the areas with the highest economic potential while ensuring poverty and inequality is eradicated through the provision of basic services and facilities in other areas. The three main priority areas of intervention of the PSDF is namely socio-economic development to ensure human development of all people in the province, urban restructuring to reduce the inequitable access to resources which the legacy of Apartheid created and to ensure environmentally sustainability which is to safeguard the long-term of the natural systems of the province (PGWC, 2009). This RSDF for Mossel Bay Municipality therefore focuses on achieving the objectives of the priorities set out in the PSDF as the main development issues of the province is reflected in the Mossel Bay Municipality itself. With Mossel Bay Municipality highly subject to the impacts of climate change, the municipality needs to become environmentally resilient and adapt to the impacts of climate change in the future. Environmental sustainable development encompasses the integration of social, economic and ecological factors into planning, decision-making and implementation so as to ensure that development serves present and future generations. It is of crucial importance for the long-term survival of people in the province that all development complies with this principle. The way this RSDF sets out to achieve sustainable development is through adopting a bioregional planning approach to protect the natural environment which is advocated by the PSDF (PGWC, 2009). The bioregional regional approach involves the management and protection of large extensive areas of land such as areas with critically biodiversity species, coastal areas and river riparian areas. Adopting this approach would lead a more holistic approach of managing the natural environment compared to the past as bioregional planning will lead to a greater understanding between the interactions of the natural environmental and human environment which is beneficial for the long-term future of any region.

It is now a well-established legislative requirement that all municipalities in South Africa whether it is metropolitan, district and local should prepare and adopt an IDP. An IDP adopted by the council of a municipality is the key strategic planning tool, which guides and informs all planning, budgeting, management, and decision making in a municipality and supersedes all other plans that guide development (EDM, 2012). Therefore, IDP's are seen as some form of regional plans however it is argued that municipal IDP's are insufficient to co-ordinate across municipalities to promote regional development despite there being provision in the Municipal Systems Acts allows for synergy between the efforts of all spheres of government to improve the combined developmental impact of the state (Todes, 2008). Despite this short coming, IDP's remain the principal planning document of the municipalities in the country. The key performance indicators of both the Eden District IDP and Mossel Bay Municipality IDP include the delivery of quality basic services such as water and electricity, facilitating the provision of quality infrastructural services such as roads and stormwater and the creation of an environment that is conducive to economic growth which will spur job creation in the region. The IDP of both the district and local municipality is thus focused on achieving the national key performance indicators which are to improve access to basic services and opportunity, alleviate poverty and inequality through job creation (EDM, 2012; MBM, 2012a). Social equity and human development can only effectively take place in a region when investment is strategically geared towards generating the maximum benefit for all people. In South Africa, municipalities are strict budgets which severely limits the amount of investment a municipality can make thus makes the allocation of municipal resources an even more important exercise. This RSDF aims to improve the decision making of the municipality so that future investments made by the municipality will lead to greater benefits which the people of the municipality will reap. This RSDF is therefore wholly geared to attain the objectives set out in both the district and municipal IDP.

The 2006 SDF of the Eden District Municipality views the town of Mossel Bay as the regional centre and focus settlement of the municipality. This means that majority of new economic and housing developments in the municipality should be guided towards the town of Mossel Bay which is aligned with the NSDP principle of investing in people not places as Mossel Bay has the most development potential in the municipality. The District SDF further quotes that "Population growth should be concentrated within the higher order settlements in the settlement system, along public transport routes, and/or in integration zones between CBD's and townships in order to support the desired spatial pattern and achieve sustainable settlements" (EDM, 2006:51). This RSDF is aligned with the district SDF as it guides both public and private investment to the town of Mossel Bay where the development potential of the municipality is located while ensuring sustainable spatial patterns are achieved. The existing municipal SDF demarcates land for future housing developments in the municipality while it also implements an urban edge surrounding the main towns to prevent sprawling development in the municipality. Figure 37 below indicates the areas identified in the town of Mossel Bay for future housing developments which is located within the urban edge of the town. This RSDF supports the notion of compact urban development in the municipality as it opens up access to social and economic opportunities that the municipality offers through its densification and infill development strategy.

Figure 37: Areas Identified for New Housing Developments (Google Earth, 2013)

6.2 Regional Planning Strategy

This RSDF recognizes that adopting a spatial targeting or unbalanced approach to the regional planning of the Mossel Bay Municipality will be much more appropriate in achieving the vision and solving the key development issues in the municipality. This spatial targeting means that there will be a major public and private investment deliberately assigned to the town of Mossel Bay rather than spreading investment all across the municipality. This spatial targeting approach will however ensure that quality basic services provided to all other towns in the municipality as the NSDP advises. The provision of basic social services and facilities will ensure that all people in the municipality in both rural and urban areas will have improved access to quality basic services such as education, healthcare and other social amenities. The first reason for assigning and guiding major investment to the town of Mossel Bay is to stimulate economic growth in Mossel Bay due to the high level of development potential the town has compared to other towns in the municipality due to its existing high levels of basic service provision and quality road infrastructure which are foundations for economic growth, other towns in the municipality do not have the same level of infrastructure to compete with Mossel Bay which is reflected by their low to medium development potential. The second reason for spatially targeting the town of Mossel Bay is due to the limited budgets of municipalities in South Africa. Therefore it is best suited that capital resources is allocated to the area which will yield the biggest benefit as previously in South Africa large amounts of money have been spend in areas with little return on investment once capital resources have been spent. With the town of Mossel Bay having the biggest population in the municipality and expected to continue to grow over the next 27 years most employment opportunities and infrastructural services will be needed in Mossel Bay compared to other towns in the municipality. The third reason for adopting a spatially targeting or unbalanced approach for regional development is due to the literature review revealing that adopting an unbalanced or spatial targeting approach to regional development is much better suited for achieving sustained economic growth and job creation which the municipality desperately requires. History has also shown balanced development has failed to achieve its goals of spatially balanced areas in terms of economic performance and social welfare. Therefore the regional planning strategy has been informed by the opportunities and trends that exist in the municipality as well as future municipal needs. The regional planning strategy is geared towards sustained economic growth with the addition of providing basic services in order to achieve social equity with regards to basic service provision. According to Kanbur & Venables (2005) "a key determinant of household well-being in a region, over and above household specific characteristics, is the quantity and quality of infrastructure in that region". The provision of basic services is to build a solid foundation for people the municipality to prosper as the key to the future well-being of any region is dependent on the level of

educational skills, healthcare and access to facilities while the provision of infrastructure is ensure that the municipality functions effectively and efficiently to create an environment that allows endogenous economic growth to place and to ensure the long-term sustainability of the municipality as moves further into the twenty-first century.

7. Regional Planning Programme

This section describes the regional planning programme for the Mossel Bay Municipality. It starts off explaining the long-term vision for the municipality based on the planning values that informs this RSDF whilst acknowledging the opportunities and constraints that the municipality faces. The vision describes how the municipality will function by the year 2040. The regional planning programme includes a population projection of the municipality based on a number of population growth scenarios which the municipality is likely to follow over the next 30 years using a geometric population projection formula. It thirdly describes the implications that the estimated population projection will have on the future of the municipality in terms of land and housing requirements and public facilities.

7.1 Vision Statement for the Mossel Bay Municipality

The Mossel Bay Municipality will be a place where its beautiful natural resource assets will define the daily lives of people and lay the foundations for sustainable living for all communities in its towns. This will be achieved through becoming an environmentally sustainable region that has a minimal reliance on non-renewable resources through the extensive use of non-motorized transport for transport, renewable forms of energy for energy and robust protection of water and critical biodiversity areas to ensure the preservation of the natural environment.

The Mossel Bay Municipality will be a place with quality public facilities and spaces that will enhance the quality of life for its entire people and lay the foundations for quality urban and rural environments where all people are able to lead the type of lives they desire. This will be achieved through the provision of schools, clinics, community parks to create the facilities and spaces that provides a conducive environment for vibrant communities where all people will have the opportunity to prosper.

The Mossel Bay Municipality will be a place that allows sustainable economic growth that creates decent employment for the population using its inherent resources, attracting local investment and creating skills for the population to meaningfully participate in the economy. This will be achieved by unlocking the true potential of the natural, built and social resources of the municipality to ensure that the tourism and manufacturing sectors of the economy are functioning optimally at all times.

7.2 Population Projection of Mossel Bay Municipality

The population analysis section revealed that in 2011 the municipality had a population of 89 430. In order to effectively plan for the municipality a population projection needs to be done to understand what the possible population of the municipality will be in 2040. It is exceedingly difficult to accurately predict the population of a region as population growth or decline is subject to highly dynamic variables such as birth rates, death rates and migration rates which may alter rapidly within a short space of time. Therefore a population projection is merely to give an estimate of people that will be living in a particular area to best inform planning decisions. This RSDF will therefore look at a number of population growth scenarios namely low growth, high growth and current growth to understand the potential population of the municipality in the future. The population projection method used in this particular projection for the Mossel Bay Municipality is based on the geometric statistical calculation using a standard formula. The geometric formula is a formula used for population projections when population number, population growth rates and time period is known as in the case of the Mossel Bay Municipality these variables are known (Raymondo, 1992).

Formula: $Pt = Po \times (1+r/100)^t$

Where: Pt= Projected Population

Po= Current Population

t= Time Period

r= Population Growth Rate

Assumed Low Population Growth Scenario if population growth rate continues to decline.

$Pt = Po \times (1+r/100)^t$

$= 89\ 430\ (1+1.8/100)^{29}$

$= 89\ 430\ (1.6775)$

$= 150\ 026$

Assumed Normal Population Growth Scenario if population growth rate remains constant.

$Pt = Po \times (1+r/100)^t$

$= 89\ 430\ (1+2.2/100)^{29}$

$= 89\ 430\ (1.8796)$

$= 168\ 096$

Assumed High Population Growth Scenario if population growth rate increases

$Pt = Po \times (1+r/100)^t$

$= 89\ 430\ (1+2.6/100)^{29}$

$= 89\ 430\ (2.1051)$

$= 188\ 259$

All the population growth scenarios indicate that the Mossel Bay Municipality will experience an increase in the population over the next 29 years. The high population growth scenario suggests that the population of the municipality will more than double by 2040 while the normal growth scenario suggests that the population will nearly double by the year 2040. The low population growth scenario suggests that an additional 60 000 people will reside in the municipality by 2040. According to Statistics South Africa, the overall population growth rate of the country will decrease for the foreseeable future and this trend will be tangible in many municipalities across the country (Stats SA, 2012b). Using that observation from Statistics South Africa and the current population trends in the municipality, it is likely that the population growth rate of the municipality will follow between the low and normal population growth scenarios. This means that the population of the municipality will be approximately between 150 026 and 168 096 by the year 2040. The median of those two growth scenarios is approximately 158 814 people which is nearly 70 000 more people than the current population total, the total will be rounded off to 160 000 people is the number which this RSDF will utilize to inform planning strategies. Figure 37 indicates how the population of the municipality will incrementally increase over five-year periods between 2011 and 2040.

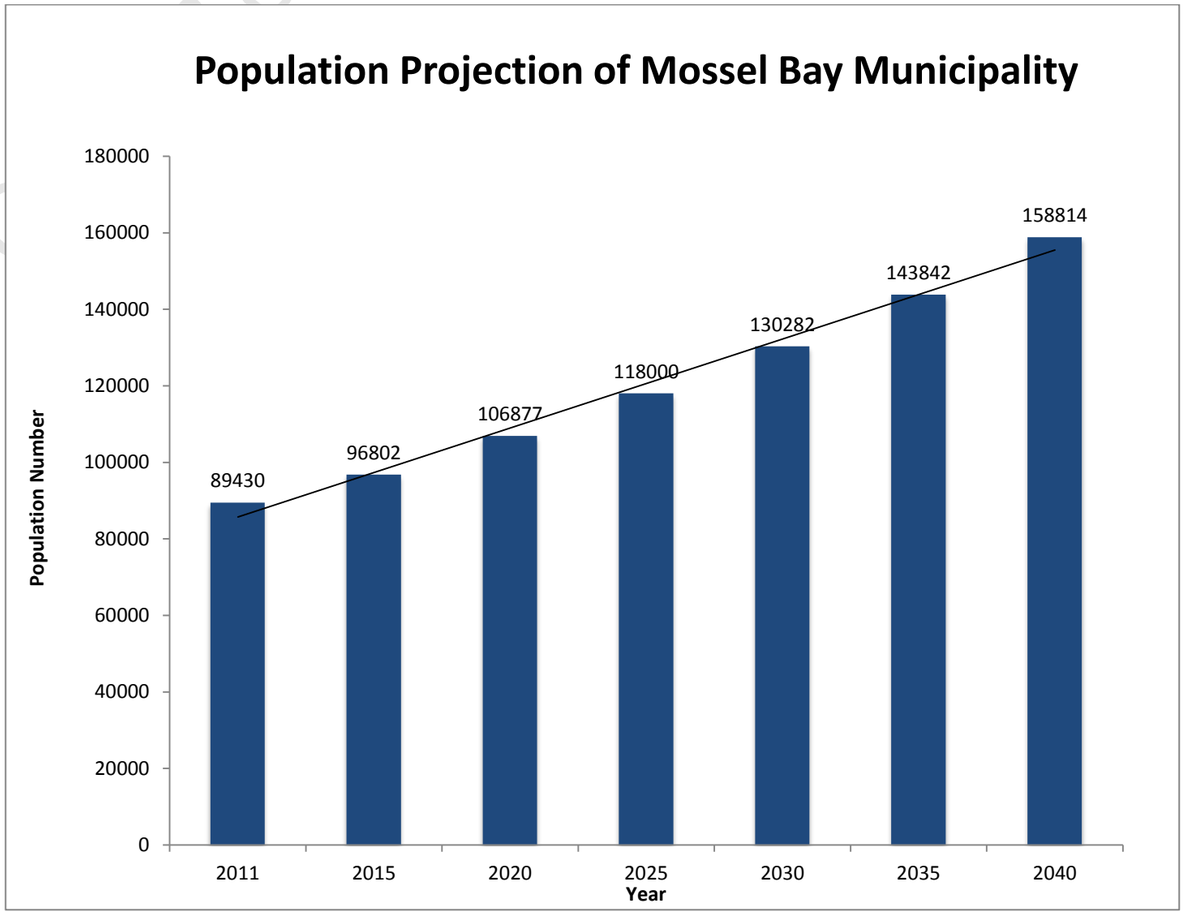

Figure 38: Population projection of the Mossel Bay Municipality (Stats SA, 2012).

7.3 Implications of the Population Projection

The anticipated increase in population has significant implications for the development and long-term future of the municipality. Firstly, areas of developable land will need to be identified for houses to be built for the additional 70 000 people. Using the municipal average household size of 3 persons per household means that 23 000 houses will need to be built by 2040 in order to provide adequate housing for all 160 000 people. Secondly, there needs to be enough jobs created in the municipality to provide employment for the increasing amounts of people in the municipality and this creation of jobs will only be possible through growth of the different sectors of the economy. Therefore existing economic sectors need to be stimulated while declining sectors need to be supported in order for the municipality to create the environment that necessitates economic growth and job creation. The increase in population will lead to a greater demand for water, electricity and sanitation requirements from the municipality. With the cost of servicing and providing basic infrastructural services such water, electricity and sanitation continually increasing and these resources becoming scarcer, it will require the municipality to come up with much more sustainable solutions in order to effectively provide basic infrastructural services. These basic infrastructural services will need to be provided as they lay the foundation for human development. With the increase in the population, there will be a greater need to provide educational and healthcare services in the municipality. Social facilities will need to be provided as they lay the foundation for social equity and justice. Table 5 utilizes the national Red Book standards to determine how many public facilities, the population of the municipality will require over the next 30 years. According to the Red Book standards by 2040 the municipality will require 72 schools consisting of 48 primary schools and 24 high schools (CSIR, 2004). The Red Book standards also advises that a population of 160 000 will require 32 clinics or mobile clinics and 2 hospitals (CSIR, 2004). The table also shows how many public facilities and houses should be provided in three ten-year periods leading up to 2040. Table 5 then shows how much space will be required for all new public facilities and housing in the municipality. Using calculations following the guidelines from Behrens and Watson, 2009 152.2 Hectares of land will be required for the provision of all the new houses and public facilities the municipality will require by 2040. This 152.2 Hectares translates into 1.5 Square Kilometers of land which proves not much land is required for the anticipated population growth of the municipality and can be accommodated in the town of Mossel Bay as figure 37 indicates.

Facility /Housing	**Existing No. Of Facilities /Housing**	**Current Backlog**	**No of Required Facilities / Housing by 2020**	**No. Of Required Facilities /Housing by 2030**	**No. Of Required Facilities /Housing by 2040**	**Land Required for Facilities/ Housing**
Primary School	22	5	32 (10 new primary schools)	39 (7 new primary schools)	48 (9 new primary schools)	13 Hectares
Secondary School	5	9	16 (11 new secondary schools)	20 (9 new secondary schools)	24 (4 new secondary schools)	19 Hectares
Public Library	8	1	11 (3 new libraries)	13 (2 new libraries)	16 (3 new libraries)	0.1 Hectares
Mobile Clinic	5	13	21 (16 new mobile clinics)	26 (5 new mobile clinics)	32 (6 new mobile clinics)	N/A
Clinic	4	14	21 (17 new clinics)	26 (5 new clinics)	32 (6 new clinics)	3.6 Hectares
Hospital	1	0	1	1	2 (1 new hospital)	1.5 Hectares
Houses	24 000	4000	35 000 (7000 new	43 000 (8000 new	53 000 (10 000 new)	115 Hectares (Pop. density of 610 people per hectare)

Table 5: Future Public Facility, Housing and Land Requirements of the Mossel Bay Municipality

8. Regional Spatial Development Framework

The RSDF for the Mossel Bay Municipality to guide the future development in the municipality from 2013 till the year 2040 is spatially represented on figure 42. The RSDF has been formulated in relation to the findings of the environmental and human settlement analysis, the legislative context under which the municipality operates in and acknowledgement of adopting an appropriate approach for the regional planning and development of the Mossel Bay Municipality. Twelve strategies in total have been formulated with the intention of solving the key development issues that the municipality faces. These twelve strategies have been developed from three separate frameworks namely the environmental management framework, economic development framework and the settlement and services framework. The twelve strategies include the four strategies from the environmental management framework which include conservative actions, protective actions and establishment of areas for the extraction of renewable energy. Four strategies from the economic development framework which sets deliberate directives with the specific purposes of generating sustainable employment opportunities and growing the economy of the municipality. Four strategies from the settlement and services framework which focuses on improving the access to and quality of the healthcare and educational facilities in municipality, improving the public transport infrastructure of the municipality and creating a much more equitable spatial and compact municipality. Collectively, the three frameworks make up the RSDF for the Mossel Bay Municipality with the intention to improve the functioning and performance of the municipality to ensure a prosperous future for the inhabitants of the region as it moves towards 2040. The recent literature on regional planning suggests that in order for regions to be competitive in a globalised economy they need to build clusters and local economies of association to gain a competitive advantage in the global economy therefore this RSDF views the building the economy of the region around the town of Mossel Bay will ensure that an competitive advantage is gained which will lead to an increased investment in the economy which will create employment opportunities for the people in the municipality. This is why the strategies in the RSDF allocates the town of Mossel Bay the majority of new public services, facilities and infrastructure in order to create the environment required for endogenous economic growth. The literature further contends that the fostering of institutional networks and partnerships for the delivery of services and facilities is crucial for regional economic growth. Therefore the strategies in this RSDF encourage the establishment of intergovernmental and public-private partnerships in the provision of new facilities and infrastructure and in the building of the regional economy. These networks and partnerships can lead to a greater success in the implementation of plans for the municipality.

8.1 Environmental Management Framework

This section is the environmental management framework (EMF) which has been formulated in relation to the findings of the natural environmental analysis of the Mossel Bay Municipality. The strategies presented in this section include conservative actions, protective actions and establishment of areas for the extraction of renewable energy. These strategies sets limits to the amount of development able to take place in the natural biodiversity ecosystem of the Mossel Bay Municipality as the municipality has a unique biodiversity within its borders that needs to be protected conserved and managed to ensure the long-term sustainability of the municipality. The strategies in this section are spatialised as shown in figure 39.

The objectives of this framework are:

- To ensure that the critical biodiversity of the municipality is protected from current and future degradation

- To ensure that the state of natural biodiversity ecosystem of the municipality is improved to ensure the long–term functionally of the ecosystem

- To ensure that the entire natural biodiversity ecosystem continues to play an integral role in the functioning of the municipality

- To increase the resilience of the municipality through the development of renewable energy projects.

8.1.1. Strategy: Conservation of the Critical Biodiversity Areas in the Municipality

It has been recognized in the biotic systems section of the environmental analysis that Mossel Bay Municipality is an area that is home to critical biodiversity that is extremely vulnerable to degradation from increased human encroachment, unsustainable agricultural practises and expansion of alien vegetation. Majority of the plant species found in the municipality forms part of the unique Cape Floristic Kingdom which not only contributes to the functioning of the natural ecosystem of province but is a major attraction to tourists therefore it has an economic function as well. Therefore critical biodiversity areas in the Mossel Bay Municipality needs to be conserved and protected to not allow the remaining critically endangered and valuable resources to become degraded. All critical biodiversity areas that need conservation are identified on the EMF map (figure 39). The first key plan of this strategy is increased engagement and partnerships between the local municipality with SANBI, Cape Nature and DEAD.P to conserve and preserve natural vegetation. As these organisations are responsible for the management of critical biodiversity areas in the province and have greater skills and resources with regards to the protection of critical biodiversity areas. Through partnerships between the municipality and environmental organisations will lead to greater protection of critical biodiversity through the implementation of their management plans. The second key plan of this strategy is the establishment of a conservation zone in critically biodiversity areas with the backing of planning and environmental legislation such as National Environmental Management Act, Spatial Planning and Land Use and Management Bill which set parameters on development in areas that will potentially will cause severe environmental degradation this is proactive planning compared to the reactive planning the municipality currents adopts. Two conservation zones have been established with the first zone not allowing any new development in the area and the second zone allowing limited development in these areas as indicated on figure 39. The third key plan of this strategy is community involvement in the conservation of critical biodiversity which will be done through community awareness campaigns to increase the importance of maintaining natural vegetation to limit activities such as polluting and illegal removal of plant species as it is not only huge developments that cause irreversible damage to natural ecosystems. While this would include involvement of communities in programmes such as working for water, working for fire programmes which are implemented to create employment whilst ensuring environmental protection.

8.1.2 Strategy: Protection of the Aquatic Ecosystem in the Municipality

The protection of rivers, estuaries and wetlands is of utmost importance to ensure that the hydrological system of the Gouritz Water Management Area remains in a quality condition as the quality of river water and functions of wetlands affects all other ecosystems in the province. The climate and water systems sections in the environmental analysis showed that with the possible effects of climate change being decreased rainfall in the region it will become vital to preserve, maintain and increase the quality of water in the aquatic system as water is non-renewable resource. It has been internationally recognised that rivers, estuaries and wetlands provide protective mechanisms in times of extreme weather events and if these aquatic systems are not functionally optimally the effects of extreme weather are increased exponentially. Therefore the protection of the aquatic ecosystem also serves as a resilience building mechanism. The aquatic ecosystem section highlighted that river flow modification and illegal water abstraction have altered the functioning of rivers and estuaries in the municipality and these sort of activities need to be prevented to preserve the functioning of the aquatic system as currently rivers and estuaries are in a good condition and will only be able maintain this condition if it is protected from the damaging activities mentioned in the environmental analysis section. Key plans of this strategy include increased engagement with Department of Water Affairs (DWAF) for support with the protection of the aquatic ecosystem. It makes sense for the municipality to partner with DWAF as they manage the entire

Gouritz Water Management which the municipality falls within. By increasing the municipalities support to DWAF it will lead to greater protection of the aquatic ecosystem which will ensure that aquatic ecosystem functions to the best of its ability which is crucial for the long-term future of the municipality. The second key plan is the establishment of river buffer zone which prevents any new development taking place within 100m of rivers and estuaries as shown on figure 39. This river buffer zone will ensure that no further degradation can take place in riparian zones of rivers and estuaries in the municipality which have been heavily degraded over the past 50 years with damaging effects. The third plan of this strategy is the implementation of municipal water quality monitoring programmes and water watch programmes in the municipality to observe which persons or businesses release waste in the aquatic ecosystem as this causes the most damage to the aquatic ecosystem as there is no physical boundaries separating rivers from people and businesses which leaves rivers and estuaries highly vulnerable to pollution and other damaging activities.

8.1.3 Strategy: Protection of the Coastal Areas of the Municipality

The Mossel Bay Municipality has approximately 50 km of Indian Ocean coastline within its borders with this coastline home to a number of ecologically sensitive and valuable features such as dunes, beaches and marine life as shown on figure 15. The coastline also plays a prominent role in the attraction of visitors to the municipality as beach resort tourism contributes significantly to the economy of the region and thirdly the coastline is used as a food source and recreation purposes by residents in the municipality. Therefore it is essential the coastal area of the municipality is protected from potentially damaging developments to ensure that the coastal environment is ecologically sustainable. With the municipality having little plans in place to prevent development and other damaging activities in ecologically sensitive coastal areas the coastline of Mossel Bay Municipality is in a vulnerable position with regards to its long-term future. A key plan of this strategy to ensure the protection of the coastline is the establishment of a coastal protection zone which intends to prevent any new development within 100m of the shoreline to protect all coastal resources, avoid hazards from potential sea-level rise as a result of climate change and the financial risks pertaining to areas at the risk of flooding (see figure 39). The implementation of the coastal buffer zone is supported by the National Environmental Management Act: Integrated Coastal Management Act of 2009 which focuses on regulating activities in coastal areas in South Africa through the restriction of development in coastal areas. The second key plan of this strategy is through establishing a partnership between the municipality and the Department of Environmental Affairs which is the governing authority of the coastline of South Africa. This partnership through its management plans will primarily increase the level of coastline monitoring which will serve to prevent illegal activities on the coastline of Mossel Bay Municipality such as pollution and dune removal which has the potential to cause tremendous environmental damage to the coastal and marine ecosystem.

8.1.4 Strategy: Increase use of Renewable Energy in the Municipality

The material flows section showed that the municipality is currently heavily reliant on non-renewable resources such as natural gas and coal for its energy requirements the municipality. The reliance on non-renewable resources is not environmentally or financially sustainable as gas and coal resources are finite which will mean the cost of providing energy from these resources will increase as the amount of gas and oil reserves decline. The extraction of gas and coal reserves from below the earth's surface inevitably causes significant environmental damage to the areas where the resources are being extracted. Coal mining also consumes large amounts of water in the process therefore the practise of gas and coal extraction does not fit into the ideals of environmental sustainable development. With the municipality receiving over 300 days of sunshine per year it allows the municipality to utilise solar energy from the sun as a means to generate electricity for use in the municipality as the climate section of the environmental analysis highlighted. Areas with limited agricultural and human development potential have been identified in the municipality as sites for solar energy and wind farms is shown on figure 39. In terms of wind energy, feasibility studies have been conducted by independent power producers in the municipality and certain sites in the municipality have yielded positive feasibility study results which mean the municipality has the potential to generate electricity from using the wind (see figure 39). With the municipality capable of generating its own electricity through utilising the natural environment the municipality will be able to supply enough energy for the growing population and industries which are dependent on electricity to function. The first key plan of this strategy involve establishing a renewable energy planning unit in the municipality with the purpose of identifying and packaging land that has renewable energy potential with the aim of fast tracking the development of renewable energy projects to increase the resilience of the municipality with regards to increasing electricity prices and to increase the sustainability of the municipality. The second key plan of this strategy is to increase engagement with both the public and private sector with regards to renewable energy projects. This engagement will involve increased support to independent and state energy providers by reducing the cost of conducting business in this sector, decreasing the amount of bureaucracy involved with renewable energy projects in the municipality and provide additional administrative support to all stakeholders involved in the delivery of renewable energy developments.

Environmental Management Framework

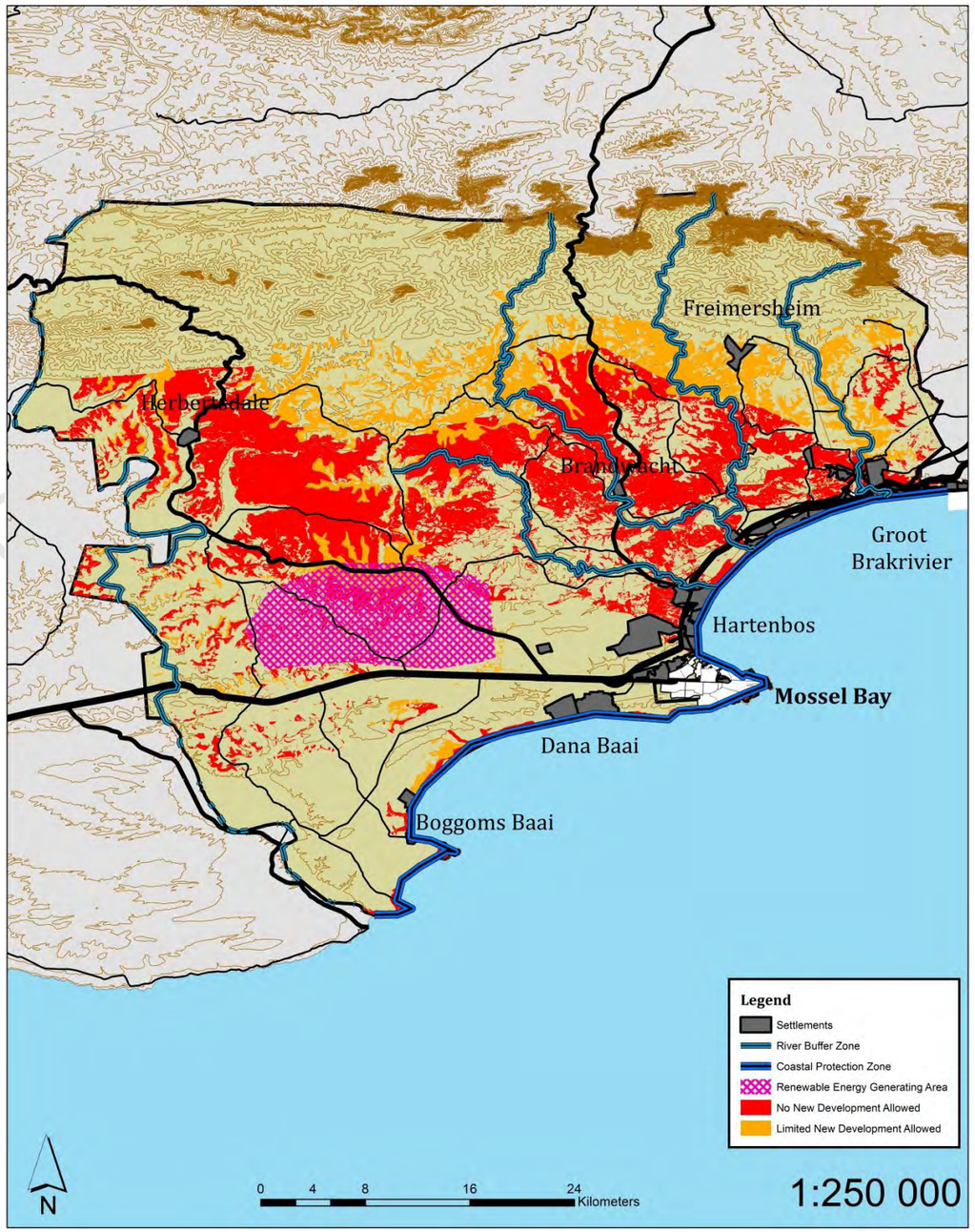

Figure 39: Environmental Management Framework

8.2 Economic Development Framework

This section is the economic development framework (EDF) which has been formulated in relation to the findings of the human settlement analysis of the Mossel Bay Municipality. The strategies presented in this section include directives with the specific purposes of generating sustainable employment opportunities and growing the economy of the municipality. The strategies formulated explicably target the economic sectors with the most potential for endogenous growth while also taking advantage of natural, infrastructural and human resource assets of the Mossel Bay Municipality. Through these strategies it will ensure that the youth unemployment problem is tackled, increase the amount of people being employed in the municipality and decrease the overall unemployment rate of the municipality. The strategies in this are spatialised on figure 40.

The objectives of the framework are:

- To ensure that there is increased access to the economic opportunities to the people who reside in the municipality

- To ensure that there is increase in the usage of the municipalities natural, physical and human resources to unlock the economic potential of the municipality

- To ensure that there is a sustainable increase in the amount of people being employed in the municipality

- To ensure that municipality becomes resilient and effectively adapts to ever increasing globalised economy.

8.2.1 Strategy: Growth of the Informal Economy

With there being little published information about the informal economy of the municipality it presents the opportunity for the municipality to investigate the potential of this often neglected but vital economic sector. It well noted that the informal economy is becoming an increasingly important economic sector in Sub-Saharan Africa as more people resort to the informal economy as means to generate an income as many people do not have the necessary skills to participate in the formal economy. This is apparent in the Mossel Bay Municipality with only 10% of people having a tertiary level qualification which leaves the majority of the population not having the necessary skills to enter certain economic sectors. The informal sector is one sector which does not require a high-level educational background but only hard work and dedication to be successful and should not be any longer ignored by the municipality. The informal economy can open up employment opportunities for many people in the municipality if the business skills of potential informal traders are properly harnessed. Key plans of this strategy include the commissioning of a study of the existing informal economy of the municipality to understand how the informal economy in the municipality operates and what can be done to support existing informal traders to expand their businesses. The second key plan is of this strategy is to grow the existing informal economy through municipal and state financial support for prospective informal trade entrepreneurs as an increasing amount of people each year do not enter the workforce as a lack of formal education which means many young people are left unemployed. The third plan of this strategy is form partnerships between informal traders and established local businesses. The partnership between businesspersons and informal traders will lead to increased support to informal traders with regards to business development skills which will ensure that informal traders have best opportunity to run their businesses successfully. The fourth plan of this strategy is the provision of informal trading infrastructure in the places where informal trade takes place such as the central business district and beaches where tourists and locals spend their time in the municipality.

8.2.2 Strategy: Enhancement and Expansion of the Tourism Sector

The economic analysis of the municipality revealed that the tourism industry contributes significantly to the economy of the municipality and it also has the greatest potential to grow in the municipality. Therefore the enhancement and expansion of the tourism industry can create sustainable business and employment opportunities for the people of Mossel Bay Municipality. The towns with the most potential for tourists include the coastal urban towns of Mossel Bay, Dana Baai and Hartenbos while rural towns near the Quteniqua Mountain range have the potential to attract visitors whom seek holiday destinations that have low carbon footprints as seen in figure 40. It is important that these towns continue to provide quality services and facilities that tourists require to ensure that large percentage of tourists repeat visits to the municipality in the future. The first key plan of this strategy includes the establishment of designated adventure tourism area in the northern mountainous area of the municipality for activities such as mountain biking, hiking and bird watching (see figure 40). The mountainous areas in the northern part of the municipality are not suitable for human development and remain largely untouched. The adventure tourism area has the potential to attract adventure seeking tourists and tourists which seek environmentally friendly holidays. The second key plan of this strategy includes the formulation of municipal tourism growth strategy document that focuses on increasing the marketing and promotion of the towns in the municipality of the municipality to both local and international markets to attract new

visitors. With both domestic and international tourism predicted to increase over the next 10 years the municipality needs to position itself to take advantage of this rise in tourism and increase the annual amount of visitors to the municipality. The third key plan of this strategy is the formation of public-private partnerships with regards to the functioning and operation of the tourism industry. This plan intends to firstly increase co-operation between the municipality and tourism businesses to ensure that visitors to the municipality receive tremendous levels of service, secondly decrease the amount of obstacles in the creation of tourism-related businesses and thirdly to afford increased support for local festivals and events that attract visitors to the municipality.

8.2.3 Strategy: Stimulation of the Manufacturing Sector

The manufacturing sector of the Mossel Bay Municipality was the single biggest sector in terms of its contribution to the municipalities Gross Domestic Product over the past ten years. This highlights the importance of the manufacturing sector in the municipality since it is a big provider of employment. With the town of Mossel Bay well positioned in relation to the major cities of Cape Town and Port Elizabeth which has large shipping airports and international airports it allows for the efficient movement of manufactured goods from the municipality to export markets around the world. This strategic advantage can result in Mossel Bay attracting manufacturing businesses to the municipality and form a thriving manufacturing hub as the unbalanced approach to regional development advocates that the agglomeration of linked industries in one specific area has many benefits. The large multinational Nestle has been operating a production facility in the town for the past 15 years and this shows there is potential for other businesses to operate successfully in Mossel Bay. A key plan of this strategy is increased public-private engagement to ensure that the manufacturing sector can grow in light of increased international completion and other difficulties. This public-private engagement will create the conditions in the municipality that is required for the manufacturing to grow such as decreasing the obstacles for the start-up of manufacturing related businesses in Mossel Bay. The second key plan of this strategy involves the municipality and other line government departments providing restricted financial incentives in the form of tax rebates and subsidised land for value adding industries that decide to establish or relocate to the municipality. These financial incentives intend to lower the cost of starting a manufacturing business in the municipality which will make it more attractive to investors and businesses seeking sites to establish manufacturing businesses. The growth of value-added manufacturing sector could create additional employment opportunities for the people in the municipality. The third key plan includes the unlocking of industrial sites in Mossel Bay which currently has the function for such activities as it has the required level of infrastructure needed for manufacturing businesses to be successful. The fourth plan of this strategy is the formulation of a municipal manufacturing growth strategy document which allows the municipality to determine which manufacturing sectors should be targeted for sustainable economic growth in the municipality.

8.2.4 Strategy: Promotion of Entrepreneurship

The Mossel Bay Municipality since 2011 has adopted a local economic development strategy which focuses on supporting innovative and sustainable entrepreneurial projects. This spatial development framework views entrepreneurship as a vital factor in the creation of employment opportunities for the population of the municipality and needs to be tapped into. Firstly, the national governments extended public works programme has provided funding for the development of sustainable projects which in turn results in the development of skills for individuals, increasing employment and decreases poverty. The types of projects which the EPWP has resulted in include working for water, working for fire, aquatic and terrestrial ecosystem monitoring programmes. The projects are implemented by local entrepreneurs who in turn are required to hire workers from their local communities. Key plans of this strategy is the creation of EPWP projects and implementation of working for water, working for water and aquatic and terrestrial ecosystem monitoring programmes which the environmental management framework advocates. With the municipality home to a vulnerable natural ecosystem these projects can be implemented which will have the dual benefit of environmental protection and job creation. The second key plan of this strategy is to create an entrepreneurial support programme with the focus of the programme on the creation of environmentally sustainable businesses in the municipality. The businesses which the municipality would target include waste collection and recycling which has the ability to create jobs as the municipality generate a large amount of waste on a daily basis which needs to be collected and can be recycled which will not only improves the sustainability of the municipality but also ensures a long-term viable business option. The third key plan of this strategy is the establishment of aquaculture enterprises in the form of fish farms in the town of Mossel Bay to utilise the sea as a means to farm fish as shown on figure 40. This plan will result in jobs created, increased food security and export products to other markets. Aquaculture is an environmentally sustainable practise as it involves the use of natural resources for the growing of fish species. With there being an increase in the global population there will always be a market for fish and the municipality can use the sea as a means to farm fish.

Economic Development Framework

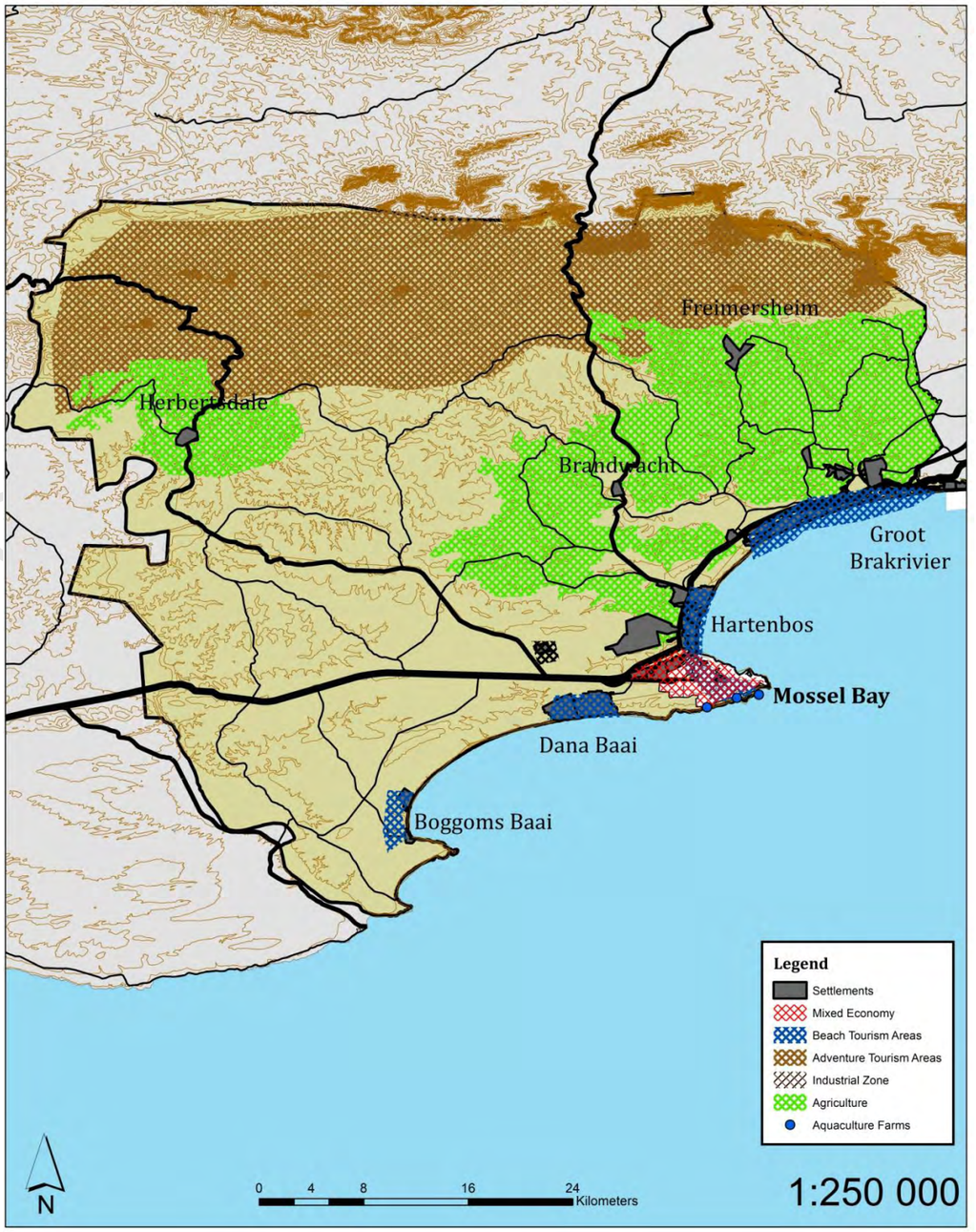

Figure 40: Economic Development Framework

8.3 Settlement and Services Framework

This section is the settlement and services framework (SNS) which has been formulated in relation to the findings of both the environmental and human settlement analysis of the Mossel Bay Municipality. The strategies include improving the access to and quality of the healthcare and educational facilities in the municipality, improving public transport infrastructure of the municipality and creating a much more equitable spatial and compact municipality. The strategies formulated intend to create a much more sustainable municipality that effectively adapts to the challenges it will face as it moves further into the twenty-first century. It focuses on improving basic public services which are essential to opening up opportunities for all people to reach their full potential, while also ensuring that natural, infrastructural and human resource assets of the Mossel Bay Municipality is utilised in a sustainable manner. The strategies presented in this section are spatialised on figure 41.

The objectives of this framework are:

- To increase the level of access and quality of educational and health services for all people in the municipality

- To increase the use of non-motorised transport in the municipality to reduce the reliance on non-renewable fossil fuels for the movement of people in the municipality

- To create a compact urban spatial form in the towns in the municipality which will become home to the future generations of the municipality

8.3.1 Strategy: Increase Access and Quality of Healthcare in the municipality

The provision of quality healthcare facilities and services to the people in the Mossel Bay Municipality is important to ensure the physical well-being of the population. The provision of quality healthcare services and facilities will also increase access to the health facilities for both the urban and rural populations of the municipality. Currently there is a high ratio of healthcare facility per person in the municipality which dilutes the quality of healthcare services the people in the municipality receive and this will only increase as the population continues to grow. By 2040, the population of municipality will need another 18 clinics or mobile clinics and 1 hospital to meet the national Red Book standards. The first key plan of the strategy include the construction of a new regional hospital in the town of Mossel Bay and building of 9 new clinics in other towns and mobile clinic services to the rural towns of the Municipality (see figure 41). This plan will see that the entire population of the municipality has access to healthcare facilities. The second key plan of this strategy is the recruitment of skilled medical healthcare staff to work at the new and existing healthcare facilities and operate the mobile clinic services (see figure 41). This plan will ensure that the level of healthcare service of the municipality is improved which means that all people in the municipality are able to receive quality healthcare. The third key plan of this strategy is the physical upgrading of the existing healthcare facilities in the municipality to increase the capacity and level of healthcare service. As the current capacity healthcare services does not meet the Red Book standard, upgrading existing facilities will improve services while also saving the costs of constructing brand new clinics in the municipality (see figure 41). All these plans involve intergovernmental-partnership as the provincial government is primarily responsible for healthcare in the municipality therefore the municipality can work with the provincial healthcare department in the identification of sites suitable for the new hospital and clinics.

8.3.2 Strategy: Increase Access and Quality of Education in the municipality

Providing quality education to the people for the Mossel Bay Municipality is essential to improve the level of skills required for the population to access and create opportunities within the municipality. Increasing the quality of and access to education in the municipality can lead to higher literacy rates and improved skill sets amongst the population which will be beneficial to the economy of the region. Just as there is a high healthcare facility to person ratio in the municipality there is a high ratio of educational facility per person in the municipality which will only increase as the population continues to grow. By 2040, the population of the municipality will require an additional 45 schools to meet the national Red Book standards but considering budget constraints this is highly unlikely therefore the municipality needs to improvise with regards to provision of educational facilities. The SNS map on figure 41 shows where the new and upgraded educational facilities will be located. The first key plan of this strategy includes the construction of 6 new primary and 4 high schools. This plan intends to lower the pupil to school ratio in the municipality as new schools are needed for the predicted increase of the municipality's population. The second key plan of this strategy is the upgrading of existing schools in the municipality by building more classrooms to increase the capacity of schools to accommodate more learners and lower class room sizes. The third key plan of this strategy is the establishment of specialised tertiary education centre in the town of Mossel Bay (see figure 41) that focuses on developing skills that is needed in the municipality such as aquaculture and tourism business development. The fourth key plan of this strategy is for the schools and tertiary education centre to be

supplemented with a network of libraries as well as mobile library services (see figure 41). Furthermore, broadband infrastructure will provided in the premises of high schools and tertiary training educational centres to ensure access to information on the internet and develop skills require in the twenty-first century. All these plans involve intergovernmental-partnerships as the provincial government is primarily responsible for education in the municipality therefore the municipality can work with the provincial education department in the identification of land suitable for the new schools.

8.3.3. Strategy: Improvement of Transport Infrastructure in the Municipality

The human settlement analysis revealed that the main form of travel by the people of the municipality is through privately-owned vehicles while people from the lower-income economic category utilise a limited but expensive public transport taxi service as the population density of the municipality does not allow a viable public transit system. The continuous increase in the price of petrol as global oil supplies decline and release of carbon emissions from vehicles that use petrol and diesel propelled engines means it makes financial and environmental sense to shift to a much more sustainable means of travel. Non-motorised transport through walking and cycling is a much more sustainable approach to travel for people in towns and cities. However, there is a currently a severe lack of NMT infrastructure to support this sustainable means of travel in the municipality. Therefore the first key plan of this strategy includes the construction of dedicated non-motorised transport lanes within the main of Mossel Bay and neighbouring coastal towns (see figure 41). This plan strategy intends on providing quality public transport infrastructure for one of the main forms of transport in the municipality is important to ensure the effective, safe and sustainable movement of people in the municipality. The plan includes improving the lighting along non-motorised transport lanes to improve the safety of people utilising NMT as a means of travel in the municipality. A bicycle and shoes subsidisation programme to provide the most impoverished people in the municipality essential equipment to utilise the NMT infrastructure. The human settlement analysis also revealed that the owners of the Mossel Bay harbour, the National Ports Authority of South Africa has long-term plans to expand the harbour (see figure 41) therefore this regional framework spatial development framework supports the expansion of the Mossel Bay harbour as this will allow the movement of goods from the municipality to international markets. The expanded harbour also allow the municipality to provide support to other existing ports in the region which can improve the efficiency of the export economy of the country and serve as an additional revenue source for the municipality. Thirdly, the increased harbour will allow additional space for boats for tourist activities such as boat rides, fishing trips, etc which is an additional attraction to prospective visitors.

8.3.4 Strategy: Promotion of Compact Urban Development in the Municipality

The human settlement analysis revealed that the population of the municipality will continue to gradually increase over the next 27 years. This population growth will render it necessary for the building of 23 000 houses to accommodate the increase of population using an average municipal household size of three people. In order to prevent to possible sprawling urban development, there needs to be the compaction of urban development to open up opportunities for the people in the municipality as research indicates compact development allows people to access better employment and social opportunities that towns present (Behrens & Watson, 2009). Furthermore, the sprawling of towns do not conform to the ideals of sustainable urban development therefore preventing sprawl is important to create a much more efficient pattern of development. With Mossel Bay having the biggest economy in the municipality it makes sense that most of the population growth will be concentrated in and around the town. Therefore there is a need that the Mossel Bay adopts a variety of strategies to ensure densities in the town increases. The first key plan of this strategy is demarcation of land suitable for future housing developments in the town of Mossel Bay for the expected increase in the municipality's population (see figure 41). This plan will lead to an efficient settlement pattern as it will prevent sprawling development which leads to unequal access to opportunities. The second key plan of this strategy is the formulation and adoption of a densification and infill development strategy to allow greater use of land in the municipality this plan intends to improve the population density of the municipality. The third key plan of this strategy is clustering of public services in the municipality (see figure 41). This plan intends to increase the exposure of public facilities and services which encourages the use of these facilities and services. It also reduces inequalities which exist in the provision of public facilities and services as more people will are able to access them if they are located in one prefecture (CSIR, 2004).

Settlement and Services Framework

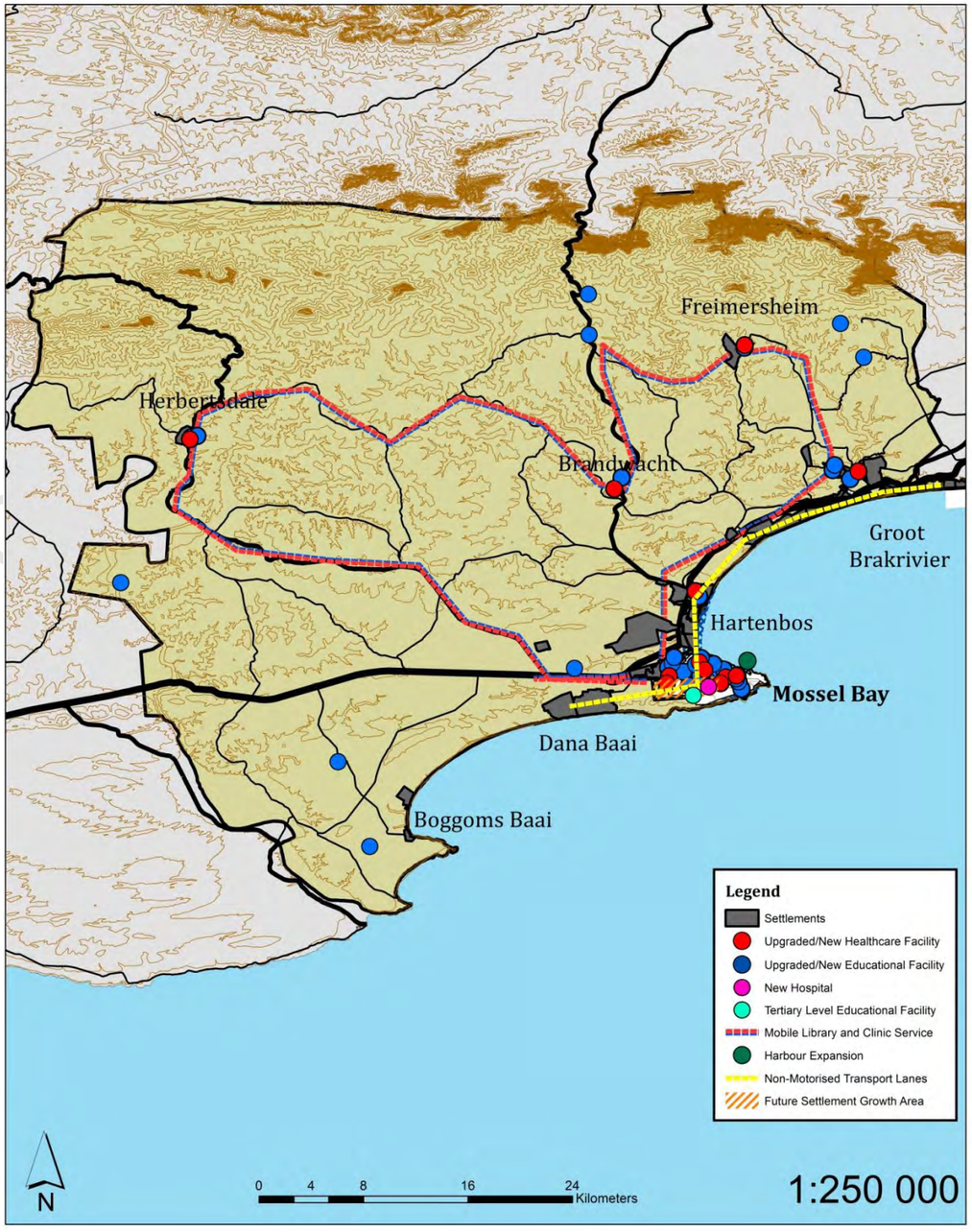

Figure 41: Settlement and Services Framework

9. Implementation

This chapter explains the overall implementation of RSDF for the Mossel Bay Municipality. It firstly begins with the presentation of the short-term, medium-term and long term implementation framework of the strategies and plans envisaged for the municipality. The individual frameworks display the RSDF strategy, specific action/plan, the stakeholders involved in the action/plan, where funding should come from and the supporting policy and legislation of the action/plan. Secondly it explains how the key projects of the RSDF will be implemented as the key projects is fundamental in realising the vision set out for the municipality by the year 2040.

9.1 Short-Term Implementation Framework

The short-term implementation framework (STIF) of the RSDF in table 6 is linked to the current IDP cycle of the Mossel Bay Municipality which runs from 2012/13 till 2016/17. With the IDP cycle of the municipality currently in its second year and the current municipal IDP budget allocated for the STIF focuses on actions and plans that does not require large capital expenditure from the municipality nor from other stakeholders. The STIF firstly deals with three strategies identified in the EMF whereby protective actions and plans identified in the EMF strategies are implemented through the collaboration between the Mossel Bay Municipality and environmental organisations such as SANBI and Cape Nature, DWAF and DEA and DEAD.P. The STIF secondly deals with three strategies identified in the SNS framework with the actions and plans focused on immediately improving basic healthcare and educational services in the municipality. This involves collaboration between the municipality and provincial departments of health and education which will provide the funding for the actions and plans highlighted in the STIF. The STIF thirdly deals with three strategies identified in the EDF whereby the municipality needs to formulate a municipal manufacturing and tourism growth strategy for the areas identified for economic activity in the EDF and to commission a study into the informal economy of the municipality to gain a better understanding the functioning of the informal economy which will inform future economic directive actions.

RSDF Strategy	Action/Plan	Stakeholders	Funding	Policy and Legislation
Protection of the Coastal Areas of the Municipality	Establishment of Coastal Protection Zone	MBM DEA	• Individual Stakeholder Budgets	Integrated Coastal Management Bill 2006
Protection of the Aquatic Ecosystem in the Municipality	Establishment of River Buffer Zone	MBM DWAF SANBI Cape Nature	• Individual Stakeholder Budgets	National Water Act of 1998
Conservation of the Critical Biodiversity Areas in the Municipality	Establishment of Conservation Zones	MBM DEADP SANBI Cape Nature	• Individual Stakeholder Budgets	National Biodiversity Act of 2004
Increase Access and Quality of Education in the municipality	Upgrading of 8 Existing Schools in Rural Towns	MBM PDE DBE	• Schools Infrastructure Backlog Grant	The South African Schools Act of 1996
Increase Access and Quality of Healthcare in the municipality	Upgrading of 4 Existing Clinics in rural towns	MBM PDH NDH	• Infrastructure Development Improvement Programme	The National Health Act of 2003
Increase Access and Quality of Education and Healthcare in the municipality	Implementation of Municipal Mobile Library and Clinic Service	MBM PDH PDE Private Sector NGO's	• Provincial Department of Health Capital Expenditure Budget	The National Health Act of 2003
Promotion of Compact Urban Development in the Municipality	Formulation of Densification and Infill Development Strategy	MBM	• Municipal Departmental Budget	Spatial Planning and Land Use Management Bill 2013
Growth of the Informal Economy	Commissioning of Informal Economy Study	MBM	• Municipal Departmental Budget	Municipal Local Economic Development Strategy
Stimulation of the Manufacturing Sector	Formulation of Manufacturing Growth Strategy	MBM EDM Wesgro	• Municipal Departmental Budget	Western Cape Provincial Advanced Manufacturing Strategy
Enhancement and Expansion of the Tourism Sector	Formulation of Tourism Growth Strategy	MBM EDM Wesgro	• National Tourism Sector Strategy Fund	National Tourism Bill of 2012

Table 6: Short-Term Implementation Framework of Regional Spatial Development Framework

9.2 Medium-Term Implementation Framework

The medium-term implementation framework (MTIF) of the RSDF in table 7 is linked to the next IDP cycle of the Mossel Bay Municipality which runs from 2017/18 till 2022/23. The MTIF focuses on directive actions that require large scale capital spending from the municipality, district municipality and provincial departments. Therefore allowing the different organisations enough time to source funds for the actions and plans to be carried out within the IDP cycle. Like the STIF, the MTIF focuses on achieving the objectives set in the different EMF, EDF and SNS frameworks through the selection of specific strategies, actions or plans. The MTIF deals with improving public transport infrastructure in the municipality through the construction of NMT lanes in the areas identified in the SNS framework. It also deals with improving the sustainability and resilience of the municipality through the use of renewable energy for electricity. This involves the construction of a 100MW photo-voltaic solar farm in the area identified in the EMF. The MTIF intentionally deals with the backlog of healthcare and educational facilities in the municipality as the actions in the MTIF ensures the construction of new clinics and schools in the municipality while ensuring that a new tertiary level institution is built in the town of Mossel Bay. The MTIF sets out the directive actions required to promote entrepreneurship, to grow the informal economy and tourism sectors of the municipality. This follows actions of the STIF, which involved the formulation of the different strategies required to ensure sustainable job creation through the existing economic sectors.

RSDF Strategy	Action/Plan	Stakeholders	Funding	Policy and Legislation
Improvement of Transport Infrastructure in the Municipality	Construction of Non-Motorised Transport Lanes in the Municipality	MBM EDM	• Municipal Infrastructure Grant • Municipal Capital Expenditure Budget	National Non-Motorised Transport Policy 2009
Increase use of Renewable Energy in the Municipality	Construction of a 100MW Photo-Voltaic Solar Farm in the Municipality	MBM Eskom Private Sector	• Major Banks • Private Investors • International Donor Agencies	The White Paper on Renewable Energy 2003
Increase Access and Quality of Education in the municipality	Construction of 6 New Primary Schools and 4 High Schools	MBM PDE NDBE	• Schools Infrastructure Backlog Grant • Provincial Department of Education Capital Expenditure Budget	The South African Schools Act of 1996
Increase Access and Quality of Healthcare in the municipality	Construction of 5 New Clinics	MBM PDH NPH	• Infrastructure Development Improvement Programme • Provincial Department of Health Capital Expenditure Budget	The National Health Act of 2003
Increase Access and Quality of Education in the municipality	Construction of Tertiary Level Education Institution	MBM DHE	• National Department of Higher Education Capital Expenditure Budget	The Further Education and Training Colleges Act of 2006
Promotion of Entrepreneurship	Establishment of Aquaculture Enterprises	MBM Wesgro Private Sector	• Municipal Department Budget	Western Cape Green Economy Strategy 2013
Promotion of Entrepreneurship	Establishment of Working for Water and Fire Programmes	MBM	• Municipal Extended Public Works Programmes Grant	Extended Public Works Programme Policy 2012
Growth of the Informal Economy	Construction of Informal Trading Infrastructure	MBM	• Municipal Infrastructure Grant	Municipal Local Economic Development Strategy
Enhancement and Expansion of the Tourism Sector	Establishment of Adventure Tourism Area	MBM Private Sector	• National Tourism Sector Strategy Fund • Major Banks	National Tourism Bill of 2012

Table 7: Medium-Term Implementation Framework of the Regional Spatial Development Framework

9.3 Long-Term Implementation Framework

The long-term implementation framework (LTIF) of the RSDF in table 8 is linked to the IDP cycle of the Mossel Bay Municipality which runs from 2023/24 till 2028/29. The LTIF focuses on directive actions which intend on building on the plans implemented in earlier implementation frameworks. The LTIF therefore continues to deal with the construction of new clinics and schools to meet the demand as the population of the municipality grows. The size of the municipality's population at this stage will necessitate the construction of a new regional hospital therefore there is action in the LTIF for this to take place. While it also continues to deal with the RSDF strategies of improving the transport infrastructure in the municipality and increasing the use of renewable energy in the municipality. It does so by expanding the harbour and constructing an additional 100MW wind farm in the area identified for renewable energy projects. The actions in the LTIF require that the municipality works closely with other governmental organisation such as the National Ports Authority, Eskom and Provincial Department of Health.

RSDF Strategy	Action/Plan	Stakeholders	Funding	Policy and Legislation
Improvement of Transport Infrastructure in the Municipality	Expansion of Mossel Bay Harbour	MBM NPA DEA	• Transnet • Development Bank of South Africa • Industrial Development Corporation	Infrastructure Strategic Framework of South Africa 2010
Increase use of Renewable Energy in the Municipality	Construction of a 100MW Wind Farm in the Municipality	MBM Eskom Private Sector	• Major Banks • Private Investors • International Donor Agencies	The White Paper on Renewable Energy 2003
Increase Access and Quality of Education in the municipality	Construction of 5 New Primary Schools and 3 Secondary Schools	MBM PDE NDBE	• Schools Infrastructure Backlog Grant • Provincial Department of Education Capital Expenditure Budget	The South African Schools Act of 1996
Increase Access and Quality of Healthcare in the municipality	Construction of 4 New Clinics	MBM PDH	• Infrastructure Development Improvement Programme • Provincial Department of Health Capital Expenditure Budget	The National Health Act of 2003
Increase Access and Quality of Healthcare in the municipality	Construction of New Regional Hospital	MBM PDH	• Provincial Department of Health Capital Expenditure Budget	The National Health Act of 2003

Table 8: Long-Term Implementation Framework of the Regional Spatial Development Framework

9.4.1 Key Project 1: Establishment of Environmental Management Zones

The first key project that is to be implemented immediately is a protection action that involves the establishment of environmental management zones advocated by the bioregional approach to planning for biotic systems. The rational of the project emanates from the strategies identified in the EMF which is to conserve and protect the terrestrial, aquatic and marine ecosystems of the municipality to ensure their long-term functionality. Therefore it involves the establishment of a conservation zones for the conservation of critical biodiversity areas, a river buffer zone for the protection of river riparian areas and a coastal protection zone for the protection of coastal areas. The focus of the project is to immediately prevent any new developments taking place in ecologically sensitive areas of the municipality which is to ensure that no further degradation of valuable biotic systems takes place now or into the future.

Actors and Funding

The establishment of environmental management zones involves the Mossel Bay Municipality, the national departments of Environmental Affairs and Water and provincial environmental governmental agencies SANBI and Cape Nature. The Mossel Bay Municipality will be responsible for the overall-co-ordination of the project which involves the administration and implementation of monitoring and working for water projects as well formulating a municipal environmental management zone policy declaring why no developments should take place in the respective management zones. The marine biologists at national department of Environmental Affairs will delineate which areas along the coast in the municipality should classified part of the coastal protection zone through fine scale mapping techniques while ecologists at national department of Water Affairs will delineate which areas in the river riparian zones will be classified as part of the river buffer zone through fine scale mapping. Both of these organisations will be responsible for the annual researching of the state of species in these zones. The scientists at SANBI will be responsible for fine–scale mapping of the areas in the conservation zones as well the conducting research on the state of species in the conservation zones. The funding for the first phase of the project should come from the budgets of each different organisation and using employed staff members to carry out the tasks for the project to be a success. Funding for the second phase should come from extended public works programmes and international NGO funding.

Phasing

Phase 1 **Time Period: 2013- 2017**	**Phase 2** **Time Period: 2018-2023**	**Phase 3** **Time Period: 2024-29**
Establishment of Partnerships between Mossel Bay Municipality, DWAF, DEA and SANBI	Establishment of Working for Water, Working for Fire and related programmes.	Monitoring and Evaluation of the Project to determine future actions.
Establishment of Conservation Zone, Coastal Protection Zone and River Buffer Zone.	Establishment of River, Coastal and Biodiversity Monitoring programmes.	

9.4.2 Key Project 2: Upgrading and Construction of Educational Facilities

The second key project that is to be implemented immediately and evolve over time is a directive action that involves the upgrading of existing educational facilities in the rural towns of the municipality and construction of new education institutions and educational infrastructure in the urban towns of the municipality. The focus of this project is on clearing the backlog in the provision of educational infrastructure and acquiring qualified staff to teach at primary and secondary schools to improve the level of education received by scholars in the municipality. Furthermore, mobile educational and literacy educational facilities which should be acquired to serve the populations located in rural areas in the municipality for people who have to cover long distances to access the existing facilities. Finally, the focus intends on decreasing the high pupil teacher ratio in the municipality which is a major deterrent to quality education. In terms of distribution of new educational facilities, the biggest and fastest growing town of Mossel Bay should receive more as it is envisaged to serve as main regional town in the municipality.

Actors and Funding

The provision of the new educational infrastructure, training and hiring of teachers in the Mossel Bay Municipality should be implemented by the Western Cape Provincial Government through its Department of Education. The National Departments involved is the Departments of Basic and Higher Education in collaboration with other government departments such as the Department of Public Works. The Mossel Bay Municipality role in this project is should secure and package its own land for construction of the new educational facilities. Funding for primary and secondary education staff will come largely from the Western Cape Provincial Education Department budget while the construction of new schools will utilize the funds made available from the national Schools Infrastructure Backlog Grant which is geared towards funding the construction of new educational facilities. The funding of a new tertiary level education centre should come from the national Department of Higher Education as it is responsible for all tertiary level education in the country. Finally, the national government should step in and partner with Mossel Bay Municipality and the provincial government to provide additional grants for primary, secondary levels, and the construction of skills training institutions.

Phasing

Phase 1 **Time Period: 2013- 2017**	**Phase 2** **Time Period: 2018-2023**	**Phase 3** **Time Period: 2024-29**
Upgrading of 8 Existing Schools in Rural Towns	Construction of 6 New Primary Schools and 4 High Schools in Urban Towns	Construction of 5 New Primary Schools and 3 Secondary Schools in Urban Towns
Implementation of Municipal Mobile Library Service to Rural Areas	Construction of Tertiary Level Education Institution in Mossel Bay	

9.4.3 Key Project 3: Construction of Renewable Energy Generating Infrastructure

The third key project is a longer-term project. Due to the long-term nature of the project, the conception stage of the project needs to happen immediately to ensure the vision of the RSDF is realised by 2040. The rationale for the project emanates from the unsustainable reliance of non-renewable materials for electricity in the municipality and commitment of the country to international agreements. The focus of the project is thus to increase the sustainability and resilience of the municipality by utilising renewable sources in the generation of electricity while additionally reducing the carbon emission footprint of the municipality. The project entails the construction of solar and wind farms in the area identified for renewable energy projects. The solar farm will utilise photo-voltaic panels to transform energy emitted from rays of the sun while the wind farm will harness energy from moderate to strong winds which will turn the turbines of the wind farm to generate electricity.

Actors and Funding

The main actors in the construction of the solar and wind farms include the Mossel Bay Municipality, Eskom, Renewable Energy Independent Power Producers and the National Energy Regulator. The municipality would need to provide administrative and planning support to those in the construction of solar and wind farms. Eskom would play a leading role in ensuring that the solar and wind farms are connected to national grid as it is the main electricity generator and operates 90% of the electricity infrastructure in the country. Renewable Energy Independent Power Producers (IPP) will be responsible for the planning, construction and operation of the solar and wind farms. The National Energy Regulator, the regulator of the energy industry in South Africa needs to ensure that the solar and wind farms meet the standards required for operation in the country. Funding for the renewable energy projects should be sourced by the IPP itself. Major Banks, large private investors and international donor agencies should be mobilised to provide funds for the renewable energy projects as they are investing billions of rand's into renewable energy projects across the African continent to promote sustainable electricity generation for the economic development of the continent.

Phasing

Phase 1 **Time Period: 2013- 2017**	**Phase 2** **Time Period: 2018-2023**	**Phase 3** **Time Period: 2024-29**
Establishment of Renewable Energy Planning Task Team within the Municipality	Construction of a 100MW Photo-Voltaic Solar Farm in the Municipality	Construction of a 100MW Wind Farm in the Municipality
Feasibility Studies of a 100MW Photo-Voltaic Solar Farm in the Municipality including Environmental Impact Assessment	Feasibility Studies of a 100MW Wind Turbine Farm in the Municipality including Environmental Impact Assessment	

10. Conclusion

The Mossel Bay Municipality is situated a unique context that requires the conservation and protection of its valuable natural resources such as the critically biodiversity areas, aquatic ecosystem and coastline. The preservation and conservation of the natural resources will optimize the functioning and performance of the municipality as the natural resources is the lifeblood of the municipality, without it simply would not survive as it is dependent on its coast, on its rivers and on its natural vegetation. Like other municipalities, the Mossel Bay Municipality faces a number of opportunities and constraints in creating the desired spatial form, however by maximising the opportunities and minimising the constraints the Mossel Bay Municipality can become a well-functioning and performing region by the year 2040. This requires the provision of quality social facilities and services, a growing economy that creates sustainable job opportunities for all its people and becoming a resource-efficient municipality with the ability to create its own energy and adopting non-motorised transport as a means to travel. Since the main development issues of the region include inefficient social facilities services, high youth unemployment rates and an unsustainable material flow system in terms of its energy usage. This RSDF aims to turn the Mossel Bay Municipality from a region that faces a number of key development issues with regards to providing opportunities for all its citizens into a region that offers all its citizens an opportunity to participate in a quality regional environment thus creating an efficient and sustainable region. It does not provide a quick fix solution to all the problems of the municipality it provides robust directives to solve the biggest problems in the municipality and robust solutions which will have the biggest positive impact on the functioning of the region by 2040. It is done through adopting an spatial targeting approach to the development of the region as the values and vision of this RSDF aims to provide all the opportunities required for people to improve their lives in the municipality.

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12. Appendix

Interview Questions for Town Planner

1. What are the key development issues of the municipality in the next 5 years and why?
2. What are the key development issues of the municipality in the next 10 years and why?
3. What are the key development issues of the municipality in the next 15 years and beyond and why?
4. Which programs and plans does the municipality have in place to solve these key development issues?
5. A major desalination plant has opened in response to the drought the region faced in 2009 is any more of these plants planned? How are these expensive engineering projects funded in the future?
6. The economy is reliant on the tourism industry what is the municipality doing to ensure a more resilient and diverse economy with not only relying on peak tourism seasons for economic stimulation?
7. The municipality is well connected to major cities and towns through the N2 how does the municipality take advantage of its relatively strategic position between Cape Town and Port Elizabeth?
8. What role does the private sector and NGO's play in solving the key development issues of the municipality? Are there any existing partnerships between these two institutions and the municipality?
9. A few renewable energy projects have undergone feasibility studies in the municipality do you think they could improve the sustainability of the region? What other mechanisms (existing or prospective) are in place to reduce non-renewable energy usage in the municipality?
10. What is your vision for the municipality in the future? How do see the municipality in the year 2040?